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Editorials

A PROPOSED AMENDMENT TO THE COLORADO CONSTITUTION WOULD AUTOMATICALLY CANCEL ALL MEDICAL, DENTAL, NURSING, LAW AND EVERY OTHER PROFESSIONAL LICENSE IN THE STATE

Demonetization of silver was the first contemporary disaster to overtake the grave western state of Colorado, and to break down its fences for progress. Trouble after trouble has since overtaken the commonwealth—one of the younger states in the Union since its admission dates back only as far as 1876. Industrial arguments, political confusions, dust storms and other ebullitions of economics or of nature are followed now by what seems to be the complete communization of Colorado. New legislation would appear to be about to sweep away the bulk of the safe and sane statutes with medicine being the wooden horse to drag the enemy, concealed and dangerous, within the gates, and the cults booting the horse from behind. Word from Colorado announces that petitions are now in circulation througout Colorado's extensive area to initiate an amendment to the Constitution of Colorado, which if adopted will effectively repeal the *Medical Practice Act; at least temporarily cancel every professional license in Colorado; repeal the bulk of the public health laws, destroy the Basic Science Law and open every hospital and all insurance and compensation practice to every conceivable type of healing cult.* What price the confusion of tongues? Chaos worse than Babel will result in the professions of medicine, law, dentistry, nursing, engineering, accounting and all other professions ad infinitum if this purposed amendment goes through. It is expected from the number of signatures already obtained to the petitions in circulation that the constitutional amendment will appear on the ballot for the 1938 general election. The amount of money that all the charlatanistic cults are pouring into this effort to achieve this sad end is almost be-

yond the imagination. Public statements of the backers of the endeavor evidence plainly that the chief objects in view are the destruction of those statutes designed to protect the public by licensing professions under state regulation, with the attack of course PRIMARILY AGAINST MEDICINE, which it must be confessed looks much like a gentle touch from Washington, D. C. Staid Colorado citizens—and some few such remain—state candidly that this is the most vicious attack ever aimed in Colorado at medicine and public health. This is the rankest of medical anarchy, and it is not Colorado's problem alone. It is the problem of every state in the Union, for what can happen in Colorado can and will happen anywhere.

The Colorado State Medical Society after eight years of agitation, in May, 1937, secured passage by the General Assembly of a Basic Science Law which was signed by the Governor and became a law July 1, 1937.

Shortly afterwards a group of chiropractors started the present movement to circulate petitions for the law's destruction. It is interesting to note and to preserve for file purposes both the title of the amendment and the admendment itself intended to be submitted at the general elections of November, 1938, and as proposed by the sponsoring cults and which run "A constitutional amendment giving to every person in Colorado the exclusive right to choose any state licensed healer or doctor in the following instances:

"1, for any examination required by the state, either mental or physical; 2, for any treatment of disease or curative service in connection with state compensation insurance or any other insurance benefits; 3, for any treatment of disease or curative service rendered such person while an inmate, patient, or charge of any institution in Colorado, which is wholly or partly tax supported.

"Granting every profession recognized by the state, complete and exclusive control over the examination, licensing and regulation of the practice of all members of such profession, through its own legally constituted board."

"BE IT ENACTED BY THE PEOPLE OF THE STATE OF COLORADO:

The Constitution of the State of Colorado is hereby amended to include therein the following ARTICLE:

"Section 1. No person shall be denied the exclusive right to choose his own State licensed system of healing and doctor for State required examinations, or for therapeutic services in connection with State compensation or other insurance benefits, nor to choose his own State licensed system of healing and to have such service rendered him while an inmate, patient or charge of tax-supported or partially tax-supported corrective, therapeutic, eleemosynary or other public institution in the State.

"Section 2. No profession recognized by the State shall be denied the exclusive right to examine, license and regulate the practice of its own members through its own legally constituted board or authority.

"Section 3. This amendment shall be self-executing and the general assembly shall enact such regulatory measures as are necessary to carry out its purposes."

Legal opinion on this movement has been expertly cited as that, if this constitutional amendment be adopted, it will:

1. Definitely destroy the basic science law passed at the last session of the legislature.

2. Repeal virtually the entire medical practice act so far as it relates to the qualifications, examinations, licensing, regulation, and control of those who desire to engage in the practice of medicine and surgery, midwifery, and chiropody.

3. Will destroy all state statutes providing for the examination, licensing and regulation of the practice of members of every profession recognized by the state.

4. Will preclude all future action by this legislature in conflict with such amendment providing for the examination, licensing and regulation of the practice of every profession recognized by the state.

5. In all cases in which mental or physical examinations are required by the state law or regulations of the board of health, make it possible for the person so to be examined, to demand that such examination be made by a doctor of any state licensed school of healing or therapy of his choosing.

This will include not only lunacy inquisitions but also the treatment of lunatics after commitment, the treatment of all persons in any legal

place of detention, where the law at present provides for their examination and treatment.

In the class where examinations are required, will fall all examinations to ascertain whether or not persons are affected with venereal diseases, to-wit: food handlers, dairy workers, manicurists, barbers, beauty operators, etc. In any of these required examinations the person to be examined may demand that the examination be made by a practitioner of such state licensed school of healing as he sees fit. While the amendment refers specifically to public institutions, tax supported or partially tax supported, there are many cases in which public wards and charity patients are of necessity confined to private hospitals under an arrangement with town, city, county, or state authorities for the payment of such hospitalization and treatment; and to the extent that such privae institutions receive their pay from the town, city, county or state or branch of state government or department, they would be held to be, in our judgment, partially tax-supported in these instances, thus making it possible for such patient, though in a private institution, to demand that he be treated while in the hospital by a doctor of such state licensed school of healing as he might select. In all compensation cases, whether the insurance is carried by the state insurance fund or a private insurance company an injured person may, in the event of the adoption of this proposed constitutional amendment, demand that he be examined and treated by a practitioner of such school as he may elect.

It is possible that this proposed amendment may be construed to be broad enough to cover all cases of private insurance benefits, such as health and accident, and permit the insured to demand that his examination and treatment be made by a practitioner of any state licensed school of his own choosing.

"The second section of this proposed amendment 'granting every profession, recognized by the state, complete and exclusive control over the examination, licensing and regulation of the practice of all members of such profession, through its own legally constituted board,' necessarily raises the question: 'What is a profession?' and 'Who is included in such classification?' The state of Colorado provides for the appointments of certain boards with power to examine and license a large number of trades or vocations.

"If any of these vocations should be held to be a profession, the proposed amendment would be in conflict with the statutes creating such boards and providing for such examination and license.

There is no uniformity of judicial decisions upon this question, and although a profession in the narrower sense presupposes special study and learning, and mental rather than manual skill, nevertheless, a great variety of trades have been construed by some courts to be professions and in other courts the opposite opinion held. We are unable to predict what the views of our own courts might be in this respect, but under the proposed amendment, any vocation or calling which may be recognized by the state as a profession will have the complete and exclusive control of the examination, licensing and regulation of the practice of its members; and any legislative regulations now in effect for safeguarding the public will, to the best of our belief be completely nullified."

"Section 3 of the proposed amendment declares that it shall be self-executing and that the General Assembly shall enact such regulatory measures as are necessary to carry out this purpose.

"If it is self-executing, the moment it becomes a part of the fundamental law of the state, that is to say, a part of the constitution itself, all existing, conflicting legislation will be instantly superseded and made invalid and a state of complete chaos will result."

LAY AGITATORS ARE ATTEMPTING TO SET UP AN ENFORCED REGIMENTATION AND PATERNALISM THAT MUST BY THEIR VERY NATURE DESTROY RATHER THAN PROTECT

Intensive public agitation for regimentation of the medical and allied professions through legislation in favor of compulsory health insurance, state medicine and devious other schemes is scheduled for the forthcoming session of Congress and throughout the year 1938. Proponents of the schemes hope to make this iniquitous state of affairs a federal as well as local measure throughout the United States.

When the Volstead Act was wiped off the statute books by a nation incensed at the results of a measure both ill-advised and, on the part of the nation's voters, at least, a *highly misunderstood* measure at the time it was put to the ballot—general opinion was that the United States was through with "noble experiments." This crusade for the made-in-Europe, un-American and unnecessary infliction upon the United States of compulsory health insurance stands witness to the fact that when it comes to a question of freak legislation, all America needs a stiff lesson in the old Yankee principle of *"Caveat Emptor."*

No matter how canny we are in business or romance, the fact remains that the average American will buy any kind of legislation at any time if he thinks it sounds well. Perhaps this is not surprising in a land where "patent" and "proprietary" nostrums flourish as the "green bay tree." When it comes to a choice between quack nostrums and compulsory health insurance there is something to be said in favor of the nostrum. The purchaser wrecks only his own health and depletes only his own pocketbook thanks to the element of volition in the use of such messes. When compulsory health insurance is "legislated" upon an innocent public, there will be no escaping its tentacles, nor the ever increasing burden of taxation for the upkeep of a lay bureaucracy whose function in life, outside of drawing fine pay for a fat job will be to play Simon Legree to scientific medicine.

That is the long and short of the matter. The appeal of "health insurance" is an appeal to the emotions. Economically and scientifically it is unsound. The average man or woman who is attracted by the richly alluring slogans of the crusaders is of the idea that this public health insurance will be as magical as the waters for which Ponce de Leon sought—and died in the seeking. The idea of this public health insurance is ladled out to the populace, as a young Golconda that can be obtained for the asking.

That something cannot be had for nothing, that a man can take out of his pocket only as much as he puts in, never occurs to the mislead citizenry that still does not realize that the increase in taxation burdening the nation is due to the extravagant socialistic projects and overcentralization that place entirely too large a portion of the people on tax-exempt government payrolls. Europe is accustomed to such bureaucratic grabs, to escape which the early American colonists suffered hardship and death in the founding of this democracy.

Never in the hey-day of German medicine (and Bismarck and the Prussian empire begot the health insurance scheme) was there such an equable medical system as has always maintained in the United States—a system made to fit American needs and emergencies. Social construction, economic mechanics and all the functioning of daily life in the United States are as different from that in the old world as is right from left. What fits Europe and European standards of living is a misfit here.

Looking more closely into the situation, it appears that compulsory health insurance *does not even fit Europe, the country for which it was custom-tailored.* Even the warp and woof from which the scheme was manufactured is incompetent to the point of worthlessness. *To begin with, statistics evidence that there is no diminishing of sickness or lowering of mortality rates in those countries with health insurance while on the other hand the cost increases at an appalling ratio.* According to these statistics (which have been repeatedly printed in this journal and others) public health insurance stands indicted by its own functioning. Peoples who possess it pay too much for nothing.

Frederick L. Hoffman, LLD, ranking as one of the foremost statisticians of the time, has declared aptly that the death rate is the ultimate test of skill and attention in medical practice.

(*Taking cancer alone as an example, to refresh the memory from figures printed here previously, in England and Wales under health insurance in* 1934 *the death rate was* 156.3 *per* 100,000. *In the United States, without public health insurance it was only* 106.3. *In England and Wales, anemia-chlorosis showed a death rate of* 6.6 *per thousand, as against* 3.1 *in the United States. As to rheumatic fever, the rate was* 3.4 *in England and Wales as against* 1.8 *for the United States.*)

Here is a definite comparison that can be carried on almost without end, in practically any group of ailments, and it shows better results without health insurance than with it. And, that too, without the onus of increased taxation, ever augmented bureaucracy and overdeveloped public dependency which are the in-

evitable concomitant of public and compulsory health insurance or state medicine.

Quoting from Dr. Hoffman, let it be emphasized that "the worst feature of compulsory health insurance is that it lowers the standards of medical practice, hinders medical progress and brings about the regimentation of the medical profession to virtually the standard of a labor union. . . . Further mass treatment reduces the adequate consideration of serious or chronic cases, which consideration is then often very superficial due to the demands upon the doctor for the treatment of less serious complaints. . . . In a comparison of forty-two causes of death between England and Wales with compulsory health insurance, and in the United States where compulsory health insurance does not maintain, all but ten were more common in England and Wales than in this country. Hence the general conclusion must be that most of the principal causes of death prevailed at a lower rate in this country than in England and Wales under compulsory health insurance."

Dr. Hoffman has compiled lengthy tables to illustrate his tests of comparative mortality figures, contrasting panel practice (Compulsory Health Insurance) and private medical practice. Made without prejudice and in an earnest effort to discover the truth the results are all against compulsory health insurance as an assert to American life. Rather was it found to be a decided liability and a drain upon income and surplus such as will tend to lower the standard of American living.

The United States has grown to independence and power through systems that have made for self-reliance on the part of its citizens rather than a national leaning upon public funds, and it is this dependence upon public funds which is one of the keynotes of compulsory health insurance. What this current crusade to install compulsory health insurance in the United States involves then, is the socialistic, ay the almost communistic creed of an enforced paternalism that must by its very nature destroy rather than protect. Compulsory health insurance, like all socialistic ideas, is dear to the heart of the social worker, whose very livelihood arises from mass undertakings encouraging public dependence. Under any system of compulsory health insurance medicine becomes the prerogative of the laity rather than the profundity of a profession.

WHY RABIES?

England, blessed with the British love of dogs, stands proudly without the blemish of a single case of rabies to blot its 'scutcheon. England has achieved this standard by insisting that all visiting dogs shall be kept in a strict quarantine for a lengthy period of time. As a consequence dogs and men need have no fear of the dread hydrophobia. As a preventable disease hydroprobia should not be listed among the perils of life in the advanced nation of the United States. Ever since last autumn the disease has been slowly but steadily on the increase.

The worst of it is that no one knows with certainty how many individuals have been infected. The frequency with which children are bitten by stray dogs and the frequency with which, especially among the poorer neighborhoods, the supposedly trivial injury is either neglected or not even reported at home or at school makes the rabies menace all the more dangerous.

It is true that many dogs who snap and bite are free from rabies and their worst affliction is a surly, mean disposition. But it is equally true that any dog that bites anybody should be kept under observation for a fortnight. If the dog is alive at the end of that time he has not had rabies and the victim need have no fear.

BUT, if the animal is a stray that cannot be observed, or if he dies of rabies before the period of fourteen days has ended those persons that may have been bitten at the onset of the disease in the animal face a sad situation. Protection from Rabies comes from immediate application of the Pasteur treatment. There are men still alive in Europe and in this country who remember the tragic experiments of Pasteur in his search for the serum. Any one who ever walked the corridors of Paris hospitals and watched the frightful agonies of rabies infected men—strong hardy men from the woods or the country districts where rabies infected dogs or wolves had bitten them—is shocked beyond belief at those who scoff at the "danger from dog bite."

Today in Illinois, yes and throughout the United States, rabies is more prevalent than it has ever been. All cities with ordinances that

dogs should not be allowed on the streets unmuzzled should enforce those ordinances as well as those ordinances insisting that dogs should not be taken abroad off a leash. No matter how gentle, nor how kind, nor how much of a trusted family pet a dog may be, the best of veterinarians will agree in the statement that "You never can tell what a dog may do, especially in the presence of a strange dog."

Especially is this true of city kept dogs, whose lives are necessarily on an artificial basis. The best of them have been known to turn berserk. A friend of the editor's who had for years loved a black chow dog that was devoted to her is a cripple today. One day, without warning, the dog went amuck, leaped upon her and so tore the ligaments of both arms that she has never recovered from the injury.

A dog is one of the best friends that man can have. No friend is more loyal and few as much so. Because a dog is such a friend of man he deserves the best of consideration and treatment from man whom he regards in the light of a god. And no man dare call himself a friend of any dog who does not take upon himself a share of responsibility in the task of stamping out rabies in the United States.

What England has done, certainly the United States can do.

And England has stamped out rabies.

THE PASSING ON OF DOCTOR SOLOMON JONES

Surgeons in many parts of the world, as well as American medical men in great numbers, were deeply grieved to learn of the death, September 25, 1937, of Solomon Jones, of Danville.

Dr. Jones had been recognized recently by eminent surgeons of America and of foreign countries, in the formation of an International Society of Surgeons.

He had served as secretary and president of the Vermilion County Medical Association, and was a member of the Illinois State Medical Society, a member also of the American Medical Association; of the American Medical Association of Vienna; of the Tri-State Post-Graduate Medical Association of America; of the American College of Surgeons; the American Board of Opthalmology and Laryngology; of the Consistory, 32 nd Degree Masons; of the First Presbyterian Church, and of the Aesculapian Society of Wabash Valley. An earnest civicist, Dr. Jones served on the medical staffs of various hospitals and other medical and sociological institutions in his community, and also had been an inspiring member of the school board of Danville, Ill. Death resulted from a paralytic stroke, sequala of a cerebral hemorrhage, that had occurred exactly a year and a day prior to his passing.

Of pioneer stock, Dr. Jones was born June 2, 1872, on an Indiana Farm. His father, James Madison Jones, also had been born on a farm close to that same Perryville, and was a well known farmer and stock raised. His mother, too, the late Ellen Skelton Jones, was of that sterling class of American citizenry indigeneous to the "valley farms" west of the Appalachians.

A sound education in grade schools of Highland Township was followed by graduation from high school, and subsequent attendance at Indiana State Normal School. After several years of pedagogical practice, Solomon Jones took up the study of medicine and in 1902 was graduated from Illinois Medical College of Chicago. At the beginning of 1903, Dr. Jones began medical practice on South Hazel Street, Danville, Ill. In 1906 he went to New York to specialize in eye, ear, nose and throat, at the New York Post Graduate School.

In 1927 Dr. Jones suspended his American practice for a time and pursued further study at the University of Vienna.

A few months after his diploma of "M.D." had been received Dr. Jones was married on Nov. 18, 1902, to Ella A. Van Veter. Their son, Jerome V. Jones is living now on the old homestead near Perryville. Mrs. Jones also survives as do also one grandson, and three brothers and two sisters, V. M. Jones, county clerk of Vermilion County; Victor Jones and Cortez Jones, both of whom reside near Perryville, Mrs. Ella Jones Randall, of Union Corner, and Mrs. Leah Jones Houser, formerly of Central Park but now resident in California. Dr. Jones had resumed his practice some six months after his first stroke and seemed recovering satisfactorily until about a week before his death.

Young in years for a man of science, Dr. Jones' demise leaves another, and an almost irreparable gap in the ranks of the thousands of

faithful followers of the practice of medicine, who have done so much for the American people. These "general practitioners" even when they become specialists of the keen calibre as was Dr. Jones, have had a grounding in human nature as well as in human physiology that sets them high and upon a firm foundation in the great Temple of Human Healing and Human Welfare. Their farm training, with the rigors and the discipline incident to American farm-life sixty, fifty, forty, aye even thirty years ago refined the earnest student of men and books with the same vigorous strokes by which a plane smooths rough lumber, and sizes the wood into timber with which to build an harmonious edifice. Many physicians of skill and power have come from the ranks of "Farm boys." Among the thousands in that class, none ever had a more devoted following—nor more justly so—and none ever lead a life of quieter sacrifice and more intense devotion to the weight of "Daily Duty" than did Solomon Jones. *Requiescat In Pace.*

BENNETT COLLEGE OF ECLECTIC MEDICINE AND SURGERY SURRENDERS CHARTER

July 19, 1937, Attorney-General Otto Kerner started proceedings (Docket number 36 C 13628) of ouster against the Bennett College of Eclectic Medicine and Surgery. The college was incorporated on or about March 25, 1869. The ouster proceedings was before Walter J. La Buy, Judge of the Circuit Court of Cook County, the clerk of said court affixed the seal of the Circuit Court at Chicago in Cook County, completeing the ouster on the 23rd day of October, 1937.

MEDICAL MAN BECOMES RECTOR OF UNIVERSITY OF PARIS

University history has been made in France with the nomination of Dr. Gustave Roussy to the highest educator's post in the country, outside of supervising functions, namely the position of Rector of the Academy and University of Paris. The new Rector was born in Switzerland, where his family had been residing since his ancestors left France after the Edict of Nantes, and was reintegrated into French citizenship. From the time when he was an interne in the Paris hospitals in 1902 he has had a distinguished medical career, which began as director of pathologic physiology research at the College de France. During the war he was ambulance doctor with the X Army, then head of the neurology center of the Lorraine Army and finally head of that of the VII Region. In 1925 he succeeded to the chair of pathologic anatomy at the University of Paris; in 1933 he was elected Dean of the Faculty of Medicine.

LEUKEMIA OF STOMACH PRODUCING HYPERTROPHY OF GASTRIC MUCOSA

Leo G. Rigler, Minneapolis (Journal A. M. A., Dec. 19, 1936), declares that leukemic infiltration of the stomach may produce a striking picture of enormously enlarged gastric rugae resembling the convolutions of the brain. Involvement of the duodenum is usually found. Radiation therapy will cause a marked reduction in the size of these folds and a corresponding improvement in the gastric symptoms is presented by the patient. The roentgen signs in the stomach may be obtained regardless of whether or not blood changes are present. Other lymphogranulomas may possibly produce a similar appearance. Chronic hypertrophic gastritis of extreme grade may simulate these roentgen appearances. Radiation therapy may possibly serve as a therapeutic test, as it does not appear to produce any change in the symptoms or roentgen signs in these cases.

GENERAL ACQUIRED ANHIDROSIS: REPORT OF CASE AND INVESTIGATIONS OF HEAT REGULATION AND CIRCULATION

Mogens Fog, Copenhagen, Denmark (Journal A. M. A., Dec. 19, 1936), reports a case of anhidrosis in a patient in whom cessation of the function of sweating occurred after he had previously been perfectly normal in this respect. The patient, aged 27, until a long febrile illness (paratyphoid fever) six years prior to the examination had had normal sweat secretion. He complained of extremely distressing symptoms under circumstances in which sweat secretion normally takes place. By means of a series of pharmacologic and physical tests the author verified the patient's statement that he could not perspire. A biopsy from the skin showed that about one half of the sweat glands were present while the other half had undergone degeneration. By means of a number of muscular activity experiments it was determined that during increased heat production in the body the patient's heat regulation was normal but that signs of circulatory insufficiency arose which must be ascribed to extreme vascular dilatation in the skin. This forms the basis for a compensating, excessive loss of heat through conduction and radiation. Continued observations of the patient during two years and a half showed that the symptoms remained unchanged.

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The Chairman of the Committee on Medical Economics of the Illinois State Medical Society is enjoying a well deserved vacation in Europe, and at his request, the Secretary is pinch hitting for Dr. Hamilton. Although he stated before the take off from the Eastern port that he was going to look around and not have any definite aim in his European visit more than to enjoy the first real vacation in years, it is the opinion of your pinch hitter that Dr. Hamilton will come home with many ideas relative to sickness insurance schemes and that he will be able to tell his many readers in the near future what they might expect under a similar system here.

During the past weeks we have been literally besieged with resolutions opposing any basic change in the manner of providing medical care in this country, and it is quite evident that the American physicians and the medical societies are thoroughly aware of the dangers on all sides. We have believed for a long time that most of the proponents of these various plans are more interested in getting the opinions of the medical profession divided than in actual attempts to get some individual plan developed through legislative activities.

All thinking physicians and most of our lay friends are opposed to any socialization schemes in medicine, especially when they know how these various plans have been operating in other parts of the world. They know that mortality and morbidity statistics have been improved more extensively in this country than elsewhere; that we have the lowest death rate of any of the larger civilized countries on earth, and that the majority of medical developments of recent years have come from our own country.

The plea has been made repeatedly by those interested in some new plan to provide medical care for our people that the United States is lacking in preventive medicine because the American physicians pay less attention to that important subject than to the scientific application of clinical procedures.

With the many immunization campaigns in every community throughout this country, with organized efforts for many years to conquer tuberculosis, cancer and other human ailments, with the work of our Health Departments in cooperation with the medical profession to stamp out contagious disease, this statement is entirely unwarranted. Nowhere, under a system of governmentally controlled medical practice, do we see so much work done along these important preventive lines as in the United States.

The Illinois State Medical Society and its members have enjoyed a most cordial relationship with the Illinois Department of Public Health for many years, and all directors of the State Department for years have been active members of their State Medical Society. We have been decidedly of the opinion that nowhere in this country can one find a more competent group of Public Health officials than we have in the personnel of the Illinois Department of Public Health. Every physician in Illinois should do his or her part in maintaining this excellent cooperation.

We have heard much about the pre-marital physical examination as a requirement in Illinois for those people contemplating the state of matrimony. We have asked Dr. John R. Neal to analyze the Saltiel Bill which prescribes the methods of making the necessary pre-marital examinations.

Dr. Neal's analysis should be of much interest to the medical profession in Illinois and elsewhere. When adjoining states enact suitable legislation so that those desiring to evade the Illinois law may no longer go to other states to be married, the real benefits of this type of legislation will be generally received.

The Committee on Medical Economics intends to have regular conferences during the

winter months and we urge the county societies to keep the important problems in medical economics in mind when developing future programs.

Miss Jean McArthur, secretary of the Educational Committee, and Dr. Robert S. Berghoff, chairman of the Scientific Service Committee, are always willing to aid all societies in procuring speakers for their meetings.

The Educational Committee with Miss McArthur as Secretary will assist in planning either scientific or economic programs, and also in arranging for speakers to talk before lay groups in any community. At this time it seems most important to get reliable information on medical economic problems before as many dinner clubs, professional, business and woman's clubs as possible.

Every county medical society can be of real service in this program by having speakers scheduled to talk before these many groups to tell them in lay terms what basic changes in the manner of providing medical care to the American people will mean to them and their families. In many communities this information has not been given to the people who are vitally interested in the subject, and who will invariably appreciate any assistance that may be given them.

It has been announced that a special session of Congress will be called early in the winter and no one knows at this time what type of legislation may be introduced which will affect the practice of medicine. During the past months there have been rumors that certain Senators and Representatives have been studying various plans for changing the practice of medicine, and they may introduce these plans in the form of bills at the coming session, which makes it more imperative that every physician should get all available information on the subject.

THIS IS THE TIME FOR ALL PHYSICIANS TO REMAIN FIRM IN THEIR OPPOSITION TO ANY BASIC CHANGE IN THE AMERICAN SYSTEM OF THE PRACTICE OF MEDICINE.

Harold C. Camp, M. D.

CRITICAL ANALYSIS OF THE ILLINOIS HYGIENIC MARRIAGE LAW

A critical analysis of the recent amendment to the marriage laws of Illinois which requires a physical examination for venereal diseases of persons about to marry, indicates that the measure leaves much to be desired. With only three months of practical experience under the new amendment, a multitude of knotty problems in administration have arisen. A satisfactory solution of many of these problems seems remote except by legislation.

The principal paragraph of the amendment reads as follows:

"Section 6a. All persons desiring to marry shall within fifteen (15) days prior to the issuance of a license to marry, be examined by any duly licensed physician as to the existence or non-existence in such person of any venereal disease, and it shall be unlawful for the county clerk of any county to issue a license to marry to any person who fails to present for filing with such county clerk a certificate setting forth that such person is free from venereal diseases as nearly as can be determined by a thorough physical examination, and attached thereto laboratory reports of microscopical examination for the gonococcus for gonorrhea and the blood Wassermann test or Kahn test for syphilis. Such laboratory examination shall upon request of any physician in the State be made free of charge by either the State Department of Public Health or the Health Department of cities, villages, and incorporated towns maintaining Health Departments."

First and most important among the factors which make difficult the satisfactory functioning of this new amendment is a lack of centralized administrative authority. As may be observed from the quotation, the enforcement of the law is entirely in the hands of county clerks, of which there are 102 in the State. No State department is charged with any duty or responsibility of enforcement. This makes uniformity of practice almost impossible with reference to any provision susceptible of more than one interpretation. It would seem desirable to make the State Department of Public Health responsible for the administration of the law and to give that Department authority to establish minimum standard regulations with respect to the technical phases of the medical examination and the required laboratory tests. This would make possible not only uniformity of practice but also a fairly accurate appraisal of the functioning of the law.

"Any duly licensed physician" is authorized by the law to give the physical examinations. Broadly interpreted, this would qualify any duly licensed physician in the world. The attorney general of Illinois has ruled that it qualifies os-

teopaths to make the physical examination. No ruling has been given as to drawing blood for the test for syphilis. Presumably this is a surgical procedure and osteopaths are not licensed in Illinois to practice surgery.

While perhaps desirable to permit licensed physicians in other States to make the examinations and execute the medical certificates, it would seem wise to set definite limitations in that respect. The Sangamon County Clerk has expressed the attitude that medical certificates executed by qualified nonresident physicians are acceptable to him only if the persons concerned in the proposed marriage are also non-residents. This seems like sound practice but may not be strictly legal under the present law. Clerks in counties that border other States are in a different situation and would no doubt be justified under many circumstances in assuming a different attitude. As the law now stands, unscrupulous practitioners might specialize in prenuptial physical examinations across the State line and do a lively business in much the same way as the clerics and magistrates at Crown Point and other places. Such practice would apparently be within the letter of the law and County clerks, especially in border counties, would have no choice but to accept the certificates and in any event would probably be disinclined to reject them. A more definitive qualification of physicians or the investment of the State Department of Public Health with authority to make general rules and regulations is needed to improve the law on this point.

With respect to blood and microscopic tests, the law states merely that to each medical certificate much be attached "laboratory reports of microscopical examination for the gonococcus for gonorrhea and the blood Wassermann test or Kahn test for syphilis." No qualification concerning the character or location of the laboratories which may make the tests appears in the law. Presumably any laboratory in the world which so desired could undertake the execution of the tests and reports therefrom would be valid according to the letter of the law. The blood tests, moreover, are specifically limited to Wassermann or Kahn. Other tests, the Hinton, for example, might prove to be more practical from several viewpoints.

The law does not state specifically that the required laboratory tests shall be regarded as an integral part of the physical examination. A literal interpretation of the text of the law would appear to make legal the reports of laboratory tests which had been made at any time prior to the filing of the medical certificate. The Sangamon County clerk has said that he interprets the law to mean that the laboratory tests are a part of the physician's examination and must therefore be executed within fifteen days prior to application for license. This attitude might not hold in court, however.

Nothing is said in the law concerning the technique of taking specimens for the laboratory tests. So far as blood is concerned, no valid question arises, specimens taken from any part of the body being equally suitable for diagnosis. Smears for gonococci, however, should be taken from the genital organs to be of value in detecting gonorrhea and even then the technique of taking the smear may be of considerable importance. The law requires merely a report "of microscopical examination for the gonococcus for gonorrhea." A smear taken from the secretions of the mouth or nose or of any other organ of the body would therefore satisfy the letter of the law.

Some county clerks have assumed the privilege of passing judgment on the implications of the laboratory reports. When the Kahn test shows a weak positive, for example, and is not significant in the opinion of the physician the latter may issue a certificate and attach the laboratory report. Literally the law obligates county clerks to issue a license if a medical certificate with the necessary laboratory reports is attached to the application. Responsibility for interpreting the laboratory reports is entirely in the hands of the examining physicians. A change in the method of rendering laboratory reports may settle this matter. Reports might be given as negative, doubtful and positive instead of negative or in graduated degrees of plus. This would be helpful but might not dispose of the "doubtful" satisfactorily.

Lack of definiteness concerning the laboratory procedure is probably the weakest feature of the law so far as accomplishing the purpose of the Statute is concerned. Relative uniformity of practice would require at least a standard

qualification of laboratories that would be eligible to do the tests. Here again it might be wise to repose in the State Department of Public Health the authority to set up standards.

The State Department of Public Health and all municipalities which maintain health departments are required by the present law to make the necessary laboratory tests "upon request of any physician within the State." Whether these facilities are utilized is entirely optional with physicians, perhaps a wise provision. At least one city, Springfield, has flatly refused to do the tests as required by the law and others have made no provisions to comply. This throws the burden of down-State laboratory work on the State Department of Public Health. In the event that the marriage rate in the State returns to normal and no change takes place in the attitude of municipalities, a considerable increase in the diagnostic facilities of the State laboratories will be required to handle the work. This implies greater appropriations.

No provision is made in the law for any exceptions to the requirement that applicants for a marriage license be free from veneral disease as nearly as can be determined by a thorough physical examination. It is conceivable that circumstances may arise which would make desirable the marriage of infected persons. An unmarried pregnant woman, for example, might be able to arrange a marriage with the father of her prospective child and one or both might be infected. A marriage with both parties under medical care might be a more satisfactory solution of such a problem than otherwise. More than 2,000 illegitimate births are reported annually in Illinois, suggesting that hypothetical case is not too far fetched. Indeed, cases of this kind have arisen for administrative decision since the law went into effect.

A kindred situation might arise between infected persons without the complication of pregnancy. Then the question arises as to whether marriage under medical supervision would be better than to run the risk of spreading the disease in question through illicit sex relations. Adequate machinery for keeping infected persons under medical treatment regardless of conjugal relations might be the best solution of situations like this, however.

Observations suggest that the requirement of the test for gonorrhea has caused more embarrassment to persons contemplating marriage and to physicians than has the requirement of a blood test for syphilis. It might be wise to make the laboratory test for gonorrhea optional with physicians and to make only the blood test for syphilis obligatory.

Modification of the law along the lines suggested in this paper seems imperative. Not only is the law subject to evasion, thus opening the way to defeat its purpose, but it has resulted in a decided decline in the marriage rate in Illinois. Sangamon County, for example, reported the issuance of 24 licenses in July, 50 in August and 51 in September of 1937 compared with 115, 141, and 121 in the corresponding months of 1936. Hundreds of couples have been married in adjoining States. While a temporary decline was anticipated it is probable that a substantial proportion of persons who have reasons to fear an examination will continue to leave the State for matrimony so long as the law in Illinois and in surrounding States makes this practice attractive. Some evasion of any law may be expected. The more practical the law, however, the fewer will be the evasions and the greater the success in accomplishing its purpose. It would seem difficult to enforce satisfactorily any law requiring premarital health examinations without centralizing administrative authority in some state department and investing that Department with discretionary authority concerning medical and other technical phases of the provisions.

J. R. NEAL, M. D.
Chairman, Legislative Committee

THE DEATH TOLL FROM TUBERCULOSIS

The Chicago Tuberculosis Institute in connection with a statistical review of tuberculosis mortality says: that 3,500,000 have died from tuberculosis in 31 years; that in the three decades mentioned enough people have died from this dread disease to constitute a city the size of Chicago.

The report pointed out that more than 200,000 men, women and children will greet the new year next week who would have died of the malady during 1936 if this disease were killing today at the same rate as in 1905, when the Christmas Seal movement was launched in the crusade against the so-called white plague.

Despite the steady decline in the number of victims, it is estimated there are still more than half a million active cases in the nation today.

A large percentage of that number are men and women between the ages of 15 and 45. Tuberculosis is still the greatest cause of death in that age-group, claiming sixty out of every one hundred lives.

Correspondence

IMPRESSIONS BY A PAST PRESIDENT OF THE STATE MEDICAL SOCIETY

To the Officers and Members of the Illinois Medical ociety:

Any man who is president of the medical society of a commonwealth as great as our own state of Illinois, is a man most highly honored by his *confreres.* It means that when the helm of their "ship of state," as it were, has been placed by them in the hands of that man, that to him has been given their greatest possession. He has been made their leader. This is tradition.

When this honor is granted to one doctor among the hundreds of efficient and scholarly men functioning in this state, in *trying times like these,* in times that are even *"bigger with fate"* than was the sailing of the Mayflower, it means that this man who has been made their president has been not only highly honored but highly trusted. To keep faith that his fellow practitioners have placed in him, must be one of the major motivations of that leader's days. Especially when he is a man living and working in one of the lesser metropolises of the state.

I know that every doctor in the state of Illinois feels that likewise the "all time high" of medical efficiency in our commonwealth is raised daily. In other words our progress never stops. In Illinois the medical profession aims ever for that perfection which includes not only scientific surety and personal prowess, a magnificent sense of ethics, an almost Brobdingnagian sense of philanthropy but also an alertness to the current economic situation as it effects medicine, both from a standpoint of passible sweeping lay control and overtaxation, to some imported condition of state medicine.

The Medical Economics Committee, the Educational Committee and above all, our ably edited official organ, the ILLINOIS MEDICAL JOURNAL, have kept faith with medicine and with humanity in their persistent campaigns that are almost sacred crusades, in the upholding of all that is best in the creed and the tenets of Aesculapius. Our editor was one of the first men in the United States to read the sign-posts along the trail and to sense that medicine was being menaced both by bureaucratic theories and socialistic practices, neither of which would be entertained by the American people, if they were informed of the nature of the concoction prepared for them by false prophets and by traitors, both by accident or with malice aforethought.

The chairman of the Medical Economics committee has been indefatigable in his efforts. Through his research and his conclusions, and their distribution, many a man has become cognizant of how great importance to the actual preservation of life and to other medical practices is this very question of medical economics, which, alas, up until lately, too many of our brethren have regarded with indifference at best, and usually with actual *ennui.*

The amount of work accomplished by the Educational Committee is almost beyond estimate. The crying need for this section and truth to tell its cries are so vigorous as to sound almost culpine—is for money with which to work and an augmented personnel for the working. It would be of inestimable benefit to every ethical doctor in the state of Illinois, and an investment of incalculable return if we were each taxed an extra dollar a month. It would not hurt any physician to contribute this small sum to this educational fund for medical defense. If we are regimented and put on a salary basis, as will happen to us all, and that possibly without much delay, it will cost us more taxes and income than the sum mentioned, and we will all have less with which to make such payments. Better give a dollar a month now to build up a defense than to be caught napping through the subtle fallacies of false economy. The chairman of the Legislative Committee has kept such a competent eye for *double entendre,* or legislative "jokers" that medical legislation in Illinois is in much better shape than in the bulk of the states. I have been at times fearful, however, that the chairman of the Legislative Committee has been let to do too much of the work alone, and that the "locals" have not responded heartily enough to opportunities to share his labors.

All in all, the Councilors during my term as president functioned in a manner that can only be described as "100%." No president ever had a better staff—might I call them a "cabinet?" From each of the eleven districts it was a positive joy to work with such good men and true, augmented as they have been by the three councilors at large and co-relating officers.

Our efficient secretary revamped all the records of our competent societies and, this done, issued a set of cards which I am sure every doctor will agree expedited the registration of the state meeting of 1937. Further, secretaries of all these component factors of the state society were sent notification of the graded standing of their county society, and, also, lists of eligible members who should be both educated and entreated into losing no time at all in becoming a member of both their local and the state medical societies. After all, civilization is fighting the mighty *organization* of bolshevism plus socialism. *"Fight fire with fire."* We must for medicine's sake, and for *humanity's sake fight organized evil with organized good.* It is beginning to look as if the medical profession must save humanity as well as medicine itself. And just as the many "refresher" courses which the Councilors have arranged for their districts, speak for themselves, so, I am sure this "refresher" course in medical obligation as well as in medical savantry, which the Medical Economics Committee, the Educational Committee and the Legislative Committee, all aided by the able ILLINOIS MEDICAL JOURNAL will soon not only *speak* but *shout* for itself, once our state organization is 100% thoroughly set up. My work when president was one of the most pleasant episodes in my life. I visited many of the county meetings and I was always encouraged by feeling of unity everywhere. It was much like experience in wartime, when, inspired by a common need against a common enemy, all men for the time became brothers under the flag! Especially was this feeling sensed when at the Council meetings and at the session with Northwestern Conference where all officers were in attendance, despite great inconvenience to several of them—a devotion to society interests that was highly touching.

In conclusion I want to make it plain to each and every member of the Illinois State Medical Society that no honor has ever been more appreciated than the privilege of having served during the year 1936-7 as president of the Illinois State Medical Society. I know from what I have seen in this part year, that there is no more earnest, able body of scientists, citizens, or sterling men and women than the makeup membership of the Illinois State Medical Society. This organization will go on in the future, as it has done from its inception, towards higher duties and greater deeds. Let us hope, and that not without reason, that even after all of us here today have turned to dust that the seed that was planted nearly a century ago when the Illinois State Medical Society was founded, shall remain fertile, and shall still beautify the world of science and the world of human need.

ROLLAND L. GREEN, M. D.

FREE DRUGS FOR LUES

A good many physicians seem to be unaware that antisyphilitic drugs to meet *all* legitimate needs may be had entirely free from the State Department of Public Health. There are no strings whatever attached to the distribution of these drugs. The only requirement is that the physician show evidence of a need. This means merely that all cases must be reported and that each patient for whom drugs are requested must be identified by name, number or initials with each request for drugs. The financial ability of the patient makes no difference whatever. The drugs are free for the treatment of *all* patients.

Physicians within the city of Chicago may obtain the drugs only from the Chicago Board of Health. An ample supply of the drugs is turned over by the State to the Chicago Board of Health to meet all reasonable requirements.

All down-State physicians, including those in the suburban metropolitan areas of Cook County, should make application for drugs directly to the State Department of Public Health at Springfield. Prompt attention will be given to requests from any licensed physician who shows evidence of a need for the drugs.

Neoarsphenamine and bismuth only are available for general distribution.

Free distribution of these drugs has been undertaken by the State Department of Public Health in order to make adequate, efficient treatment available to every infected patient in Illinois. More than 18,000 new cases of the disease have been reported in the State to date this year, evidence of the magnitude and seriousness of the problem.

Frank J. Jirka, M. D.
Director of Public Health.

"THE HALL OF HEALTH"

At the meeting of the Council of the Illinois State Medical Society on October 25, 1937, it was voted that an educational exhibit open to

the public should be arranged in connection with the meeting of the Society in May, 1938, in Springfield, Illinois.

This exhibit, to be known as "The Hall of Health," and located in the Elk's Club Building will be open to the public from Monday, May 16, to Saturday, May 21, 1938.

The American Medical Association, the Illinois State Medical Society, various County Medical Societies, specialty societies, the Illinois State Departments of Health, Public Welfare, Education and Registration, the medical and dental schools and various organizations that are interested in the prevention, treatment or social aspects of various diseases will, it is hoped, participate.

Such exhibits depicting the advances that have been made and methods that are being continued or instituted in combatting disease should be of inestimable value. Moving pictures, charts and other demonstrations are more effective in telling these stories than are lectures or published articles.

The medical exhibits at the "Century of Progress" in Chicago had a greater attendance than did almost any other group of exhibits. The Hall of Health at the meeting of the Wisconsin State Medical Society in Milwaukee in September, 1937, was visited by over 100,000 people. While the Hall of Health at the Springfield meeting in May will not be as large or as comprehensive as that of the Century of Progress, it should be of a character that should attract at least as many visitors as did the Hall of Health of the Wisconsin State Medical Society.

Committee on Scientific Exhibits.
J. S. Templeton, Chairman
J. P. Simonds
E. H. Weld
C. F. Harmon
A. W. Meyer
N. S. Davis, III, Secretary

RESOLUTION ADOPTED BY THE COUNCIL OF THE ILLINOIS STATE MEDICAL SOCIETY CONDEMNING SENATOR LEWIS' PROPOSAL TO REGIMENT THE PROFESSION

A RESOLUTION

WHEREAS, Senate Joint Resolution 188 (Illinois Medical Journal Activities, Page 289), introduced on July 28, 1937, in the Senate of the United States by Senator J. Hamilton Lewis of Illinois, proposes to federalize the medical profession of the nation, making every licensed physician and surgeon a civil officer and subject to prosecution and penalization in Federal Courts for special causes enumerated in the Resolution; and

WHEREAS, Such action being clearly a case of class legislation is contrary to the principles of constitutional government; and

WHEREAS, The obligation imposed by the Joint Resolution upon each licensed physician of rendering needed medical service to any and all impoverished who make application to him would inevitably overwhelm practitioners of outstanding reputation, create the necessity of elaborate machinery to determine who would qualify as "impoverished" or in lieu thereof open the way for fraudulent practices, political interference and tend to lower the standards of medical practice; and

WHEREAS, The authority reposed by the Joint Resolution in the Social Security Board would lead almost certainly to fee fixing by governmental agencies and would necessitate a nation-wide accounting and investigating system that would add a tremendous indirect cost to the nation's bill for medical care; and

WHEREAS, The penalties imposed by the Joint Resolution on persons who violate the provisions thereof are so exorbitantly severe as to create a deterimental and inimical psychology in the medical profession; and

WHEREAS, The proposed plan would lend itself easily to political abuse and become a stepping stone to communistic and socialistic government; and

WHEREAS, Poverty itself is the fundamental cause of most of the ills which the Joint Resolution seeks to cure and prevent through the superficiality of a superimposed medical service; and

WHEREAS, The proposed plan would inevitably become a bitter cup of belated disappointment to thousands of poor and needy people who pin their faith of salvation from the tribulations of life upon this scheme, even as the Townsend mirage and the Huey Long "Share the Wealth" halucination became; and

WHEREAS, The enforcement of local laws already on the statute books would provide as adequately for the sick-poor as modern facilities and circumstances make practicable; and

WHEREAS, The needy now enjoy as adequate medical care as economic limitations and the vagaries of human nature would make possible under the proposed plan; therefore, be it

Resolved by the Council of the Illinois State Medical Society in regular session assembled. That Senate Joint Resolution 188 is inimical to the best public interests, is un-American and unworkable, would result in monumental expenses without yielding compensating benefits, would lead to political corruption and tyranny and ought to be defeated; and, be it further

Resolved, That copies of these resolutions be forwarded to the President of the United States, to each Senator and Representative in Congress from Illinois and to the Secretaries of the Medical Societies of the several States.

Note: Our State Society feels that it should take a prominent place in the opposition to Senator Lewis' proposal in view of the fact that he is the senior sena-

tor from the State of Illinois. We are asking every prominent medical organization in the United States to take specific action in the matter and pass resolutions similar to the one passed by the council of the Illinois State Medical Society. We believe that if said action generally adopted by medical societies and a copy of the resolution is sent to Senator Lewis and also a copy to each of the two Senators from the respective states and to the Congressmen it will have a telling effect when the matter is presented to Congress again.

REPORT OF EDUCATIONAL COMMITTEE TO COUNCIL:

September and October, 1937

SPEAKERS BUREAU:

56—Programs were arranged for lay groups. Speakers were scheduled for a number of meetings of County Federation of Women's Clubs. Other groups requesting speakers were Rotary Clubs, Parent Teacher Associations, Y. M. C. A.s, Kiwanis Clubs, etc.

A letter was sent to the secretaries of county medical societies suggesting that their members try to arrange to have speakers before all lay groups in their counties and offering the services of the Educational Committee in supplying suitable speakers.

MAILING LIST:

Public Libraries—

The material prepared in the office of the Committee for newspaper publication is sent weekly to

49—Chicago libraries

84—Downstate libraries

Public Health Chairmen—

31—Health Chairmen of Clubs and Parent Teacher Associations are on the mailing list and receive material on medical problems and current health subjects.

Home Advisers—Extension Department University of Illinois—

49—County Advisers receive the above material weekly.

Presidents and Secretaries of County Medical Societies are now being sent copies of all material released through the Educational Committee office.

A total of 1704 pieces of material were sent to the above groups.

SERVICE TO COUNTY MEDICAL SOCIETIES:

315—Notices sent for LaSalle County
190—Notices sent for Bureau County
233—Notices sent for Effingham County
102—Notices sent for Jefferson-Hamilton County
135—Notices sent for Perry County
131—Notices sent for Franklin County

Newspaper publicity about county medical societies:

7—Notices for Chicago Medical Society opening meeting
4—Notices for North Shore Branch
39—Notices for LaSalle County
68—Notices for Bureau County
21—Notices for Jefferson-Hamilton County
18—Notices for Monroe County
24—Notices for Wayne County
47—Notices for DeWitt County

Announcements of lay programs sponsored by Chicago Medical Society sent to all Chicago libraries and enclosed in all correspondence.

PRESS SERVICE:

40—Health columns sent to newspapers for monthly article.
724—Health columns to downstate papers who use material weekly or daily.
680—Health columns in editorial style to downstate papers.
146—Health columns to Chicago newspapers.

Articles written and approved on the following subjects:

The Doctor Looks at the Blood Count
Immunity and Immunizations
Infantile Paralysis Increases Sharply
Health of the Middle Aged Woman
Appendicitis a Treacherous Condition
Just a Cold or Pneumonia?
Popular Fallacies
Running Ears
Beware of Colds
Pupils' Health
Vitamin Values
How Is Your Mental Health?

SCIENTIFIC SERVICE:

43—Speakers were secured for county medical societies.

A number of Heart Clinics were arranged.

See special report attached about the Special Programs in Obstetrics and Pediatrics.

Counties assisted with scientific programs were:

Union
Iroquois
Greene
Effingham
Bureau
St. Joseph's Hospital, Aurora
Will-Grundy
Knox County
Stephenson County
Schuyler
Coles-Cumberland
Lee
Whiteside
Wayne
Williamson
Jefferson-Hamilton
Fulton
DeWitt
LaSalle
Monroe
Montgomery
Morgan

RADIO:

33—Radio programs were given over stations WBBM, WGN, WJJD, WAAF

Most of the programs are dialogues and are proving very satisfactory.

MISCELLANEOUS:

800—Radio announcements were mimeographed and sent to presidents of Parent Teacher Associations, Women's Clubs, libraries, etc.

350—Announcements of health projects of the Illinois Federation of Women's Clubs were prepared for the public Health Chairman of the Federation.

Cooperation of the Educational Committee with the State Department of Public Health in the special programs in obstetrics and pediatrics.

Dr. Harold H. Hill contacted secretaries of county medical societies following an introductory letter sent out by the Educational Committee.

He arranged with secretaries to hold special meetings in 8 sections of the state.

The securing of the speakers was done through the office of the Educational Committee.

A statistical report will show the amount of special work which the Committee has assumed in an effort to make these programs highly successful—

200—Letters were written to obstetricians to ascertain if they cared to participate in this work and if so the subjects they would be prepared to present.

101—Follow up postal cards.

Coles—Cumberland—Clark—Douglas are holding monthly meetings—Oct. 7, Nov. 4, Dec. 2, Jan. 6, with 8 speakers.

These programs to date have required:

16—Letters
62—News releases

228—Postal card invitations to doctors

LaSalle County—are holding weekly meetings—Oct. 21, 28, Nov. 4, 9, 18, with 9 speakers.

These programs to date have required:

24—Letters
46—News Releases

388—Mimeographed postal card invitations

Lee—Whiteside Counties—holding bi-weekly meetings, Oct. 7, 21, Nov. 4, 18 and Dec. 2, with 12 speakers.

These programs to date have required:

28—Letters
29—News releases
135—Double postal card invitations to doctors.

Hancock County—holding monthly meetings Nov. 1, Dec. 6, Jan. 10 and Feb. 7, with 8 speakers.

These programs to date have required:

13—Letters
30—News releases
172—Double postal card invitations

Lawrence—Crawford—Jasper Counties are holding weekly meetings Nov. 16, Dec. 21, Jan. 18 and Feb. 15, with 8 speakers.

These programs to date have required:

12—Letters

News releases and invitations are going out in November so are not included.

Morgan County—is holding two meetings Oct. 28 and Nov. 18, with 12 speakers.

These programs to date have required.

30—Letters
150—Mimeographed copies of the program

Union—Perry—Jackson Counties are holding monthly meetings on Nov. 18, Dec. 2, Jan. 13, Feb. 3, March 17 and April 14, with 10 speakers.

These programs to date have required:

12—Letters

Jefferson—Hamilton—Wayne—Franklin and Saline Counties are holding meetings on Nov. 5, Dec. 9, Dec. 23, Jan. 27, Feb. 18 and March 18, with 9 speakers.

These programs to date have required:

15—Letters

Invitations and newspaper releases go out first of November, so are not included.

The amount of work in connection with these programs has been tremendous and a decided additional burden on the office of the Committee. The work has been done because it was felt that these programs were excellent and every effort should be made to let the doctors know about them. The wishes of the local societies have been followed in all matters and the secretaries have written most gratifying letters of appreciation for the help given them in promoting these meetings. Respectfully submitted,

JEAN MCARTHUR.

WOMAN'S AUXILIARY TO THE ILLINOIS STATE MEDICAL SOCIETY

Slogan for 1937-1938

TO BECOME MORE AUXILIARY MINDED

The program compiled by the State Program Committee is a completely informative message to the County Auxiliaries. It is complete and interesting as well as instructive. It is the hope of all that the Auxiliary members in the group organized first may profit from this program, as well as the newest members.

The following is from the State Program:

How Does a Member Support Her Auxiliary?

1. Paying dues
2. Attending meetings
3. Accepting offices and chairmanships in other organizations, especially those related to health, in order that—
   a. Informed speakers may address them
   b. Approved material may be given them
   c. Programs and projects to be undertaken shall be scientifically sound
   d. She may keep informed about medical matters and activities in other organizations
   e. Report to her President and Society *Programs* and *Projects* which are unwise and unacceptable; report to be made through advisers
4. Promoting good fellowship by affability at meetings; by attendance at entertainments and conventions; by assisting as requested
5. By fulfilling the charges as given through the advisors

County News

St. Clair County members had an enjoyable meeting October 7, at St. Mary's Hospital Auditorium in East

St. Louis. The relation of religion to medicine was the theme of the talk by Rev. B. J. Koehler. The book, "The Art of Ministering to the Sick," written by a minister and a doctor, was referred to by the speaker.

Mrs. R. F. Stanton, presided at the meeting.

The next meeting will be a tea, November 11, at the home of Mrs. Wendell Stuart.

Cook County Woman's Auxiliary to the Chicago Medical Society had the regular October meeting at the Chicago Woman's Club. The following were guests: Dr. Rollo Packard, President of the State Medical Society; Dr. G. W. Post, Jr., President of Chicago Medical Society; Dr. Frank Maple, Secretary of the Chicago Medical Society, and the Presidents of all the branches were present with few exceptions. Dr. Frank Maple spoke to the group on *Socialized Medicine*. It was most interestingly presented.

The daughter of a member, Lois Russell Holsman, gave several enjoyable vocal selections.

Mrs. Harry Dooley presided. Mrs. Chas. Seegal is Program Chairman.

Aux Plaines Branch members had a Laity Day, October 22.

Dr. J. C. McMillan spoke briefly upon the current bills to come before the National Body of Lawmakers.

Dr. Louis Smith spoke on "What the Medical Society Is Doing to Combat Syphilis."

May I request, at this time, that all information and press clippings concerning your Auxiliary be sent to the Publicity Chairman at an early date? This may be done by the local publicity worker or any designated member. Everyone is interested in learning the activities of others, but it is not possible unless sent to the proper source.

LOUISE W. SMITH (Mrs. C. Otis),
Ch. Press and Publicity.
1012 Pleasant Street, Oak Park, Ill.

THE PASSING OF HENRY K. MULFORD

America lost one of its foremost exponents of preventive medicine in the passing of Henry Kendall Mulford, in his 71st year, on October 15, 1937.

The company which bore Mr. Mulford's name was the first in this country to commercially distribute antitoxins. Smallpox vaccine and curative serums used in the prevention and cure of infections and contagious diseases were soon added. Through the distribution of these biologicals, he was probably responsible for the saving of more lives than any other man in the history of medicine and pharmacy. These alone stand as a fitting monument to his life of service to humanity, and, thanks to his stimulating influence on the younger men whom he drew around him, the good work that he accomplished and new work started will continue to grow on and on.

The story of the life of Mr. Mulford, as unfolded by men who have known him since his embarkation into the field of pharmacy, is of interest. Born in Bridgeton, New Jersey, October 10, 1866, of old New England stock, H. K. (Henry Kendall) Mulford came from a family of sea captains, and his forebears played an important part in local history. He attended the Bridgeton elementary school, later the South Jersey Institute, a military prep school having a curriculum comparable with present college work.

The degree of Master of Science was conferred upon Mr. Mulford by Lafayette College in 1918, and the highest honor in pharmacy, Master of Pharmacy, was conferred upon him by his Alma Mater, the Philadelphia College of Pharmacy and Science, in 1933. He was a member of the American Pharmaceutical Association, American Drug Manufacturers Association, American Pharmaceutical Manufacturers Association, American Chemical Society, the Franklin Institute and the Union League.

UNITED STATES CIVIL SERVICE EXAMINATIONS

The United States Civil Service Commission announces open competitive examinations for the following positions:

Junior Medical Officer (Rotating Interneship), $2,000 a year.

Junior Medical Officer (Psychiatric Resident), $2,000 a year.

The place of employment is to be St. Elizabeths Hospital, Washington, D. C. Applications for these positions must be on file with the U. S. Civil Service Commission, Washington, D. C., not later than November 29, 1937, if received from States east of Colorado, and December 2, 1937, if received from Colorado and States westward.

For the position of Junior Medical Officer (Rotating Interneship) applicants must be fourth-year students in a grade A medical school. For the position of Junior Medical Officer (Psychiatric Resident) applicants must have successfully completed 4 years of study in a grade A medical school not prior to January 1, 1935, and must have the degree of either B. M. or M. D. In addition they must have successfully completed an interneship of at least 1 year, provided that applications will be accepted from persons now serving an accredited rotating interneship.

Full information regarding these examinations may be obtained from the Secretary of the United States Civil Service Board of Examiners at the post office or customhouse in any city which has a post office of the first or second class, or from the United States Civil Service Commission, Washington, D. C.

DR. COLWELL'S DAILY LOG FOR PHYSICIANS

This is one of the most practical and simple systems of bookkeeping yet offered physicians. It offers a bird's eye view of a medical man's daily financial condition. The "Daily Log for Physicians" is issued by the Colwell Publishing Company, Champaign, Illinois. Price $6.00.

This is the eleventh edition of the Daily Log. For over a decade this volume has been a first aid to every busy doctor. Since the beginning of the publication of the "Daily Log" it has been subjected to yearly revision and annotations though the general principal remains the same.

Medical schools provide little or no training in book-

keeping. Many physicians unacquainted with the "Daily Log for Physicians" and using crude methods of their own invention will welcome the 1938 edition. The work displays important income and expense items. Figures that are essential not only for income tax returns, but for budgets, legal aid, watching progress.

Subsidiary to the financial records are several memorandum forms; records of inoculations, surgery, obstetrics; government-required records of nacotics dispensed and social secuity tax figures.

The author of the Log is a physician with an excellent background of a city and country practice. It is edited by the Doctor annually and brought up-to-date in the light of new needs suggested by users.

A GRADUATE COURSE IN VENEREAL DISEASE CONTROL

Graduate courses for training in the various phases of veneral diseases control have been instituted by Western Reserve University, Cleveland, Ohio, under authority of the United States Public Health Service and the Ohio State Director of Health. They will be open without fees to health officers and to physicians cooperating with state and local health departments in the states of Ohio, Michigan, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Missouri, Kansas, Nebraska, North Dakota and South Dakota, but the number who can be admitted is limited. The course may be entered at any time when a vacancy exists, usually for a duration of three or four months or longer. Visitors may also be admitted for shorter periods, if they can be accommodated.

The training will be informal and adapted to the individual needs of those taking the course. For example, to a clinician in a venereal disease clinic much clinical material is available and that portion of the training will be stressed. For the educator in a state health department, in addition to the clinical course, source material for talks to both lay and professional groups will be available and the student will be expected to prepare varied lectures. For the health department officials in addition to these features, case finding, case holding and morbidity reporting will be discussed more fully.

Physicians who desire to take these courses should apply through their State Health Department to the Ohio State Director of Health. Application blanks, if not already at hand, can be obtained by addressing Dr. C. C. Applewhite, Regional Consultant for the United States Public Health Service, Room 314, U. S. Court House, Chicago, Illinois.

IOWA AND ILLINOIS CENTRAL DISTRICT MEDICAL ASSOCIATION MEETING

The fall meeting of the Iowa and Illinois Central District Medical Association was held September 29, 1937 at the Blackhawk Hotel in Davenport, Iowa.

At 3 p. m. Frederick A. Willius, M. D., cardiologist of the Mayo Clinic of Rochester, Minn., delivered an address, "Coronary Disease," which was discussed by Fred M. Smith, M. D., professor of Medicine at the University of Iowa, Iowa City, Iowa, and J. A. Laymn, M. D., of Moline, Illinois.

At 4 p. m., Alphonse M. Schwitalla, Dean of the St. Louis University School of Medicine and president of the Catholic Hospital Association of the United States and Canada delivered an address, "Social Aspects of Medical Practice."

At 5 p. m., George de Tarnowsky, M. D., professor of Surgery at the University of Illinois School of Medicine, Chicago, Illinois, delivered an address on "Low Back Pain," which was discussed by H. P. Miller, M. D., Rock Island, Illinois, and W. G. Bessmer, M. D., Davenport, Ia.

Dinner was served at 6.30 p. m.

At 8:15 p. m. Morris Fishbein, M. D., editor of the Journal of the American Medical Association, Chicago, delivered an address on "The Doctor and Social Security."

The addresses of Father Schwitalla and Dr. Fishbein were broadcast over radio station WHBF, Rock Island, Illinois.

NINTH GORGAS MEMORIAL ESSAY CONTEST ANNOUNCED

Announcement of the Ninth Gorgas Memorial Essay Contest has been made by Admiral Cary T. Grayson, Chairman, of the Board of Directors of the Gorgas Memorial Institute, from the office of the institute at 1835 Eye Street, Northwest, Washington, D. C. The essay contests have become an annual feature of the program of personal health education carried on by the institute. High schools throughout the country are invited to enroll. Participation is restricted to students in the third and fourth years of high school.

For the best essay written in each school, a bronze Gorgas medal is awarded and the student so honored represents his school in the State competition. A prize of $10 in cash is given for the best essay in each State. The judges are state officials—the state health office, state superintendent of education and the secretary of state. The state-prize-winning essays are then judged for the national awards. First Prize is $500 in cash and a travel allowance of $200 for a trip to Washington to receive the prize. Second Prize is $150 in cash and Third Prize $50.

The subject for this year: The Achievements of William Crawford Gorgas and Their Relation to Our Health.

The dates of the contest: October 21, 1937, to January 21, 1938.

Full information concerning the contest may be found on school bulletin boards or can be obtained from the Gorgas Memorial Institute, Washington, D. C.

MISSISSIPPI VALLEY MEDICAL SOCIETY AWARD

The Mississippi Valley Medical Society offers a cash prize of $100.00, a gold medal and a certificate of award for the best unpublished essay on a subject of interest and practical value to the general practitioner of medicine. Entrants must be ethical licensed physicians, residents of the United States and graduates of approved medical schools. The winner will be invited to present

his contribution before the next annual meeting of the Mississippi Valley Medical Society (September 28, 29, 30, 1938), the Society reserving the exclusive right to first publish the essay in its official publication—the Radiologic Review and Mississippi Valley Medical Journal. All contributions shall not exceed 5000 words, be typewritten in English in manuscript form, submitted in five copies, and must be received not later than May 15, 1938. Further details may be secured from Harold Swanberg, M. D., Secretary, Mississippi Valley Medical Society, 209-224 W. C. U. Building, Quincy, Ill.

REMOVING ADHESIVE PLASTER

For the painless and most satisfactory removal of adhesive plaster, it should be thorougly moistened with "KARITH CLEANING FLUID." Karith Cleaning Fluid is quick and effective. It does not contain carbon tetrachloride. Its use is not accompanied by the odor or unpleasantness and danger common to carbon tetrachloride type products.

Karith Cleaning Fluid is manufactured by Karith Chemical Company of Chicago, Illinois, and is carried by drug stores.—J. W. W., Ill. Med. Jour., Nov., 1936.

GOLFERS SPECIAL TO A. M. A. MEETING

A. "Golfers Special" to the San Francisco meeting of the A. M. A. is being organized by the American Medical Golfing Association. Physicians who like golf mixed with their travel will find five games arranged on the trip out to the coast for the A. M. A. meeting of June 13, 14, 15, 16 and 17, 1938, and three games on the return trip through the Northwest. The first game will be played in New Orleans, reached by the Steamship S. S. Dixie, from New York (or via a rail itinerary) on Tuesday, June 7, 1938. Other stops include Houston, Galveston and San Antonio, Texas; Los Angeles and Del Monte, California; and finally San Francisco, where the big A. M. G. A. tourney will be held on Monday, June 13, 1938.

The return trip includes Portland, Oregon; Seattle, Washington; Vancouver, B. C.; and Lake Louise and Banff, and finally St. Paul and Chicago.

Non-golfers as well as golfers, and their ladies, are WELCOME and will find the A. M. G. A. Special a glorious experience.

For full particulars write Dr. Walt P. Conaway, 1723 Pacific Avenue, Atlantic City, N. J., the President of the A. M. G. A.; or Bill Burns, Executive Secretary, 2020 Olds Tower, Lansing, Michigan.

MINERAL WATERS IN JAMAICA COMPARE WITH SPAS OF WORLD RENOWN

Comparing favorably with spas of world-wide renown, the Thermal Mineral Bath at Milk River, Jamaica, B. W. I., 52 miles from the capital Kingston, has been found by many people to be very beneficial. It is claimed that the radio-active properties of this spring has stood the test of over a century. In fact the mineral water of the Milk River Baths has been proclaimed as one of the most remarkable of its kind in the world. The water, which is extremely saline, issues from crevices in the rock direct into the baths. The temperature of the water maintains a uniform 92 degrees Fahrenheit throughout the year. Besides being rich in mineral salts, it possesses a high radio-activity which is said to render it of great therapeutic value. This water is specially recommended for gout, rheumatism, sciatica, lumbago, neuralgia, eczema, and kidney and liver troubles.

EXAMINATIONS—AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY

The next examinations (written and review of case histories) for Group B candidates will be held in various cities of the United States and Canada on Saturday, November 6, 1937, and Saturday, February 5, 1938. Application for admission to these examinations must be filed on an official application form in the office of the Secretary at least sixty days prior to these dates.

The general oral, clinical and pathological examinations for all candidates (Groups A and B) will be conducted by the entire Board, meeting in San Francisco, California, on June 13 and 14, 1938, immediately prior to the meeting of the American Medical Association.

Application for admission to Group A examinations must be on file in the Secretary's Office before April 1, 1938.

For further information and application blanks address Dr. Paul Titus, Secretary, 1015 Highland Building, Pittsburgh (6), Pa.

UNDEREATING VS. OVEREATING

The Illinois State Medical Society 37th week release directed to health officers contains the following valuable information:

Recent studies here and abroad yield convincing evidence that undereating ranks ahead of overeating in the cause of ill health among the masses. A study by Jeghers in Boston and one by McGonigle in Stockton-on-Tees (England) indicate that a large proportion of people either from necessity or choice spend too little for food and consequently suffer demonstrable and not infrequently serious impairment of health.

McGonigle observed a group of 152 families (710 persons) that were moved from slums into government-built houses. Their rental expense was greater with no increase of income, reducing funds available for food. During the first 5 years in the new houses the death rate was 46% higher than during the previous 5 years and was up by about an equal proportion above that of a similar group left in the slums during the 5 years and above that of the general community and the nation. Careful study of all factors showed that a reduction in quality of diet was responsible for the unfavorable experience.

Jeghers examined 162 students of Boston University School of Medicine primarily for vitamin A deficiency. He found evidence of deficiency, indicated by "night blindness" or delayed adjustment of vision to darkness, in 55 of the students. Focal infections and other ills were much more frequent in the 55 than in the others, or normal group, and the duration of colds was considerably longer in them. No person in the normal

group ate less than two adequate meals daily whereas 60% of the "deficiency" group ate only one adequate meal per day. Coffee and doughnuts or rolls for breakfast and a sandwich or two for lunch, the usual meals for this 60%, was not considered a complete or adequate meal. "The folly of the prolonged substitution of a sandwich, roll or doughnuts for one or more complete meals is evident," declared Dr. Jeghers.

Undereating among the masses is a matter of quality and variety of foods rather than too little quantity. Most people get enough food to prevent hunger but many are underfed with respect to the nutritional requirements of the body. Proper choice of foods and an adequate supply are especially important to health during the fall and winter because of limited sunshine, indoor life and relative scarcity of fresh fruits and vegetables.

OWNERSHIP OF ROENTGENOGRAMS

The question whether the roentgenograms of a hospital patient belong to the patient or to the hospital was answered by a court for the first time, so far as is known, in Hurley Hospital v. Gage, decided on appeal, April 21, by the circuit court for the county of Genesee, Mich. The patient had been roentgenographed in the roentgenographic department of the Hurley Hospital at Flint. The usual charge for the service was included in the patient's bill. He made a payment on account but refused to pay the charge for roentgenographic service unless the roentgenograms were delivered to him. The hospital refused to deliver them and sued the patient for the balance due. In the justice's court where the suit was instituted, judgment was given against the hospital. The hospital, however, because of the principle involved, appealed to the circuit court of Genesee County. At the hearing on the appeal, no one appeared on behalf of the patient and the case was heard and judgment rendered without the submission of evidence or argument by him. In giving judgment, the court pointed out that the hospital sold and patients paid for, not the material that went into roentgenograms, but knowledge and experience. The protection of the hospital might depend largely on the proper preservation of the roentgenograms and, said the court, the films should remain with the hospital. Judgment was given against the patient for the balance due on his bill, covering the amount charged by the hospital for the roentgenograms.

BLOOD PICTURES IN PRIMARY DISEASES OF LYMPHATIC SYSTEM: THEIR CHARACTER AND SIGNIFICANCE

B. K. Wiseman, Columbus, Ohio (Journal A. M. A., Dec. 19, 1936), discusses only those primary lymph node diseases and the blood changes produced by them which are susceptible to treatment with radiation. These consist of lymphosarcoma, lymphatic leukemia and Hodgkin's disease. It is probable that, excepting the benign hyperplasias, all primary diseases of the lymphoid tissues difficult to classify belong in one of these three classes. All grades of lymphatic leukemia may be encountered, ranging from the pathologic state without leukemia, through benign states resembling chronic lymphocytosis, to those which are rapidly progressive and rapidly fatal. Many of these types show very little resemblance, cytologically, clinically or histologically, to neoplasia. Lymphosarcoma may be characterized hematologically either by a leukemic or by a nonleukemic blood picture. The former constitutes a type of leukemia (leukosarcoma) which possesses special features of neoplasia and is rapidly progressive and very radiosensitive. Hodgkin's disease, usually but not always, possesses a characteristic blood picture. These characteristics are interpreted as suggesting an alteration of the reticulum cell-monocyte maturation cycle arising from an infectious agent. Careful blood studies in the control of radiation therapy in this group of diseases are necessary if optimum therapeutic results are to be obtained.

COMPOUND SOLUTION OF TANNIC ACID

Bernard Fantus and H. A. Dyniewicz, Chicago (*Journal A. M. A.*, July 17, 1937), show by experiment that the more concentrated solutions of tannic acid produce a denser and therefore probably more efficient crust. They conclude that 10 per cent of tannic acid is likely to be the most desirable strength of the solution. In view of the fact that the solution is intended to be applied to a raw surface, it seems logical that isotonicity might be desirablee or, better, that the ions naturally existing in the tissue juices be present in the solution ("iso-ionia"). This suggests the use of physiologic solution of sodium chloride or, still better, of Ringer's solution as the solvent. Through experiment they find that Ringer's solution is the best solvent for the tannic acid. The density of the precipitate is influenced by the hydrogen ion concentration of the solution. The densest complete precipitation occurs in the zone between *p*H 2.82 and 3.22. In the tubes of *p*H below 2.83 and above 6.42, not all of the tannic acid is precipitated, there being a turbid supernatant liquid; and, in the most acid and most alkaline tubes, there is a turbidity but no precipitation whatever. It is concluded that, if density of precipitate is the criterion, the 10 per cent solution of tannic acid at its own *p*H of 3.22 will probably answer the purpose best. Benzoic acid as well as salicylic acid is successful as a preservative for the tannic acid solution. On the basis of their experiments the authors recommend the following formula for compound solution of tannic acid: 0.42 Gm. of potassium chloride, 0.84 Gm. of calcium chloride, 1 Gm. of salicylic acid, 10.5 Gm. of sodium chloride, 100 Gm. of tannic acid and enough distilled water to make 1,000 cc. This is mixed, permitted to stand with occasional agitation until dissolved, then filtered if a clear solution is desired. The authors also recommend that 10 per cent silver nitrate solution be applied to the tannic acid crust. The recommended tannic acid solution is endowed with good preserving qualities, produces a denser coagulum and has bacteriostatic action, which is absent in the plain tannic acid solution. This solution is being used successfully for crust formation in the treatment of burns at the Cook County Hospital.

Original Articles

PENUMONIA IN CHILDHOOD ETIOLOGY AND CLASSIFICATION

JOSEPH BRENNEMANN, M.D.
CHICAGO

Taken as a whole, pneumonia in childhood is a serious disease with a high mortality. H. O. Jones[1] reported in 1926 that the mortality from pneumonia in children under five years of age in Chicago had exceeded that due to diarrheal disorders in 1918 and had maintained that lead since that time. This does not, however, tell the whole story. The mortality varies widely with age and clinical setting. It is high in the first year or two, notably among those less favorably situated economically, it approaches the vanishing point in later childhood, no matter what the economic and social status may be. It is obvious to the experienced practitioner that pneumonia is not a uniform disease in childhood, that it has a varied etiology and that it manifests itself in widely different forms and degrees of severity.

Pneumonia of the adult is usually frankly lobar in type. The same is true of uncomplicated pneumococcus pneumonia at any age, even in infancy. One still encounters too often the idea that pneumonia in the first year or two of life must be bronchopneumonia simply because it occurs at that early age and this carries with it the erroneous assumption that all pneumonias at that age have a high mortality. Pneumonia rarely occurs in the first few months of life; beyond that period uncomplicated pneumococcus lobar pneumonia is a relatively mild disease as far as mortality is concerned. The important point to bear in mind is not that pure lobar pneumonia may not occur at that age, but that bronchopneumonia is much more common in infancy and early childhood than it is in later life and that it is this fact that makes pneumonia, as a whole, statistically considered, so much more severe and so much more fatal at that early period.

Several factors enter into the etiology of bronchopneumonia at this age. It is practically always secondary to an infection to which the child is not yet wholly, or adequately immune, such as the common cold, measles and whooping cough, and especially those ill-defined more serious infections that pass under the name of grip or influenza. It will be remembered that an analogous condition was evident during the World War in the high incidence and mortality of pneumonia among those who were not immune to measles. A second factor lies in the fact that young children, and especially infants, of the underprivileged class are less resistant to such primary infections and react to them more seriously. The effect of this when combined with herding in infant wards and orphan asylums will be stressed later. A third factor, perhaps the outstanding one, is mixed infection, or super-infection in which the hemolytic streptococcus, a staphylococcus, and, if we may accept more recent observations, the influenza organism of Pfeiffer play the leading roles. It is probably this, and not the primary pneumococcus infection, that determines the high mortality of bronchopneumonia as we shall see later. This association may occur also in lobar pneumonia but less frequently and less decisively. Finally, some 32 types of pneumococcus have been identified in children, and their etiologic and clinical significance has not been worked out to the same extent that it has been possible to do in the rather simpler situation in the adult.

In all primary pneumonias a pneumococcus plays the leading role both as to incidence and initiation of the disease. Infection may result from contact with a child who has pneumonia, or from a carrier, i.e., it may be exogenous in origin. Again, it may be endogenous, i.e., a latent germ may assume virulence, or there may be a favoring change in the host brought about by such factors as exposure, chilling, or neglect of a cold or grippy infection. Carriers may play a greater part than we know in both methods of infection. In some series of tests in healthy children in institutions from 50% to 100% have at times harbored the organisms.

Attempts are being made to classify the penumonias of childhood for practical purposes according to bacterial etiology and type as has been done more successfully in the adult. This has been done especially by Trask,[2] at Yale, to whom I am much indebted for whatever scientific flavor has been added to my own practical experience in this presentation. The complexity of the problem has made such attempts for the present rather more of didactic interest than

Presented as part of a symposium on Pneumonia in Childhood before the Pediatric Section of the Illinois Medical Society at Peoria, May 18, 1937.

of practical significance. Nevertheless, it is becoming increasingly evident that classification of childhood pneumonias must be based as far as possible on specific etiology, as well as on clinical experience. For the present we must accept the conventional clinical classification that divides them into two types, lobar pneumonia that may, or may not, appear as an uncomplicated pneumococcus infection; and bronchopneumonia that has a more varied etiology and a wider clinical ramification and is usually a mixed infection in which the pneumococcus may play the dominant, or at least the initial, role or may not enter into the picture at all so far as can be determined.

The differentiation between lobar and bronchopneumonia is by no means always easy or even possible at the bed-side. Both may occur at the same time. Sometimes the pathologist alone can tell whether there has been a lobar pneumonia, a bronchopneumonia of lobar distribution, or both. The significant points in the clinical differentiation are the abrupt onset and termination, the frank consolidation of one or more lobes and the absence of râles in other portions of the lungs in lobar pneumonia; the insidious onset, prolonged course and more gradual, variable termination, the presence of fine and coarse râles throughout the lungs and the late and patchy appearance of consolidation in bronchopneumonia. Again, it is difficult or impossible to differentiate between a severe bronchitis alone and a bronchopneumonia which is always associated with an extensive bronchitis, except by the degree of fever and prostration and the course of the disease. Bronchiolitis, or capillary bronchitis, to which attention will be drawn later, is even more difficult to differentiate, because it is usually a part of the bronchopneumonia itself. Migrating or wandering pneumonia, a type of lobar pneumonia in which two or more lobes are successively invaded, a relatively benign infection, is often mistakenly interpreted as a more serious bronchopneumonia, for no other reason than that it has spread and that it occurs in a young child.

Both types of pneumonia are nearly always definitely preceded by an upper respiratory tract infection. It is obvious that infection enters the body more frequently by the respiratory route than by any other and that the primary invasion is in the nose or throat. From this it may invade the blood stream or extend downward along the tracheobronchial tree. While blood cultures yield positive results in a fair proportion of cases the prevailing evidence points to a bronchogenic route of invasion in both types, though there may be little involvement of the bronchi and bronchioles. In lobar pneumonia we expect the stereotyped story of a cold, a cough, a sore throat with little fever for a few days preceding the rather sudden onset of higher fever and a more serious illness that ushers in the pneumonia. In bronchopneumonia, in addition to the factor of age, there is usually the evidence of a more serious grippy, "influenzal," or streptococcal respiratory infection or measles, whooping cough, or more rarely scarlet fever.

It is commonly impossible to tell whether a streptococcus, a staphylococcus or the bacillus of influenza of Pfeiffer is a sole primary or a secondary invader. If there is a streptococcus or a staphylococcus septicemia it is, of course, logical to assume that a complicating pneumonia is due to the same organism. Increasing attention has recently been directed, notably again by Trask[2] and others, to the importance of the bacillus of influenza as a complicating factor in childhood pneumonia. It is perhaps well to state that the bacillus of influenza, so-called by Pfeiffer, is not here assumed to have an etiologic relationship to what is commonly known as influenza. Trask has reported an association of this organism with a pneumococcus, usually with Type III, in nearly all necropsies on children dying of pneumonia and has attributed the severity and high mortality to that association. He has reported that the infection due to the Peiffer bacillus travels along the bronchi and bronchioles and causes a characteristic necrotic destruction of the mucous membranes. The necrosis and desquamation lead to blocking of these air passages with resulting fatal atelectasis and emphysema in those that come to autopsy.

This condition is said to be identical with bronchiolitis, or capillary bronchitis, which may occur alone as a definite clinical entity, or as a superinfection in either lobar or bronchopneumonia, especially the latter. It is evident that a bronchiolitis, or capillary bronchitis, which is characterized by dyspnea, cyanosis, generalized fine râles, emphysema and late or absent evidence of consolidation is hard, or impossible, to differentiate from bronchopneumonia. It is also evident that these terms need sharper definition in common usage if we are all to talk the same lan-

guage. It is interesting that Henoch, many years ago, said that capillary bronchitis in a child under four years of age meant bronchopneumonia.

There is a condition that is occasionally found in young children, most often in infants, that is hard to differentiate from what has just been described as bronchiolitis, or capillary bronchitis, except by the generally favorable course. These children have as fine râles as one ever encounters, present in great profusion throughout both lungs. They are not profoundly sick, quite regularly recover in a comparatively short time, and yet from the very nature of the râles the seat of the inflammation can only be assumed to be in the finer bronchioles.

Streptococcus pneumonia is a severe type of bronchopneumonia in which hemorrhages occur not infrequently especially adjacent to the pleurae. It is frequently accompanied by empyema. The specific etiology can be suspected if there is a streptococcus infection in the throat and can be assumed to be established if the pneumonia is secondary to scarlet fever, or to a streptococcemia, or if the organism appears in pure culture in empyemal fluid.

The role of the staphylococcus is distinctive and of special interest. It is not a common, but a very serious cause of pneumonia in infancy where it occurs most frequently. Under six months of age staphylococcus pneumonia is nearly always accompanied by multiple abscesses of the lung and by empyema, often by suppuration of the hilar lymph nodes. All of this, together with the fact that the lung involvement is usually merely a part of a staphylococcemia, in itself one of the most fatal septicemias, readily accounts for the high mortality from staphylococcus pneumonia. The diagnosis may be assumed from the age period and the severity and long duration of the disease, and is established by a positive culture from the pus obtained by thoracentesis. While one usually expects a fatal termination in staphylococcus pneumonia and empyema in infants in the first semester of life, the prognosis is by no means hopeless. We have recently had two infants three months and five months of age respectively, at the beginning of the illness, who ultimately made a complete recovery following thoractomy and after many weeks in an oxygen tent.

The term "interstitial pneumonia" is often used to designate the type that occurs in virus diseases, such as measles, in which there is a peribronchial infiltration that is sometimes demonstrable in x-ray films as small, circular areas of greater density than that of the surrounding tissue.

A serious but rare type of bronchopenumonia is that due to Friedlander's bacillus, in which focal areas of necrosis occur. Still other rare types are caused by the germs of psittacosis, or parrot fever, plague, glanders and hog cholera. In hog cholera which is primarily a virus disease, the bacillus suipestifer is a secondary invader and it is this organism that has been incriminated in a number of pathologic conditions in man and among them bronchopneumonia. Discussion of the embolic bronchopneumonias that occur with septicemia or pyemia is beyond our present scope.

A final type of "pneumonia" has only recently been recognized. In 1925 Laughlen[3] described a lung condition which passes under the name of lipoid, or lipid, pneumonia that is due to the inhalation of oils or fats. The disease is probably more common than is realized and may ultimately explain pathologic changes in the lungs of hitherto unsuspected etiology. In uncomplicated form lipoid pneumonia represents an irritation with fibrosis, not an infection. Unless infection supervenes it is afebrile. It runs a chronic course often of many months' duration. Since it is due to the inhalation of a foreign substance it follows the rule of invading the right lung more often than the left. While nearly any oil may produce some irritation, some are much more irritating than others. Again, it is obvious that some oils are much more likely to be inhaled than others. For this reason milk fat, cod liver oil and mineral oil are the chief and most frequent offenders. The conditions under which inhalation of oil take place can readily be visualized: the young, weak or marantic baby that vomits while lying on its back unable to turn even its head; the infant or young child who sputters and coughs and chokes while his nose is held as cod liver oil or mineral oil is forced down his throat; the child too sick to cough, or to resist, while oily nose drops are being administered. The degree of invasion depends, on the one hand, on the amount of oil inhaled usually not so much at one time as in repeated smaller amounts over a longer period of time; and, on the other hand, on the nature of the oil itself. Vege-

table oils, such as olive and sesame oil, produce little reaction. Animal oils, such as milk fat and cod liver oil are much more irritating and especially so if they contain a large amount of fatty acids. While the pulmonary lesions are not as a rule destructive in character, hemorrhage and even gangrene may occur when chaulmoogra oil, rancid lard, or cod liver oil with a high percentage of fatty acids is aspirated in sufficient amount. The physical signs, both on clinical examination and in the x-ray film, are much like those of a bronchopneumonia. There are patchy areas of consolidation extending out from the hilum, usually more marked on the right side.

In a discussion of the etiology of pneumonia in infants one cannot as yet ignore a consideration of the role that has been, and to no negligible extent still is, played by infant wards, and the old-fashioned foundling home. Even under the most favorable circumstances it still happens that an infant who enters an infant ward for some minor illness acquires an upper respiratory tract infection, a pneumonia, and dies. One hesitates to dwell on the condition as many of us have known it in the past, and as it still exists to some extent under unfavorable conditions. The reasons why an infant ward presents an etiologic hazard are not hard to see. These infants are at a highly susceptible age. They come for the most part from the underprivileged class and have not had such food and hygienic surroundings as make for maximal resistance to infection. Under such unfavorable conditions they are now subjected to mass exposure to other patients, to nurses, interns, residents, attending men and visitors. The effect of herding, even on the adult, was amply exemplified in army cantonments during the World War. There is furthermore a lack of rest, so essential at that age and in sickness. There is too much noise, too many examinations, too much nursing care at regular hours. I think one may add there is too little individualization, too little mothering. It is interesting to note that while the newborn baby in maternity wards is hedged about by the most formidable array of precautions against infection there is relatively little danger here as compared with that which exists in the infant ward. I was glad to have Finkelstein confirm my own observation that the newborn infant is relatively immune to those infections during the first two or three months of life.

The corollary to all that has been said is obvious; no baby should be sent to an infant ward if he can be taken care of adequately in the home or in an Out-patient Department, and he should be sent out as soon as it is safe to do so. Interns, residents, nurses and visitors who have any respiratory tract infection should be excluded from the wards. I have tried to keep an open mind with reference to masks but am still in doubt. The present wide-spread tendency to substitute foster home care for institutional care is significant in this connection. Dr. Chapin who has developed a marvelous system of foster home care in New York, in what is known as the Speedwell Plan, once told me that he was devoting the rest of his life to furthering foster home care in order "to make up for the wrong he had committed in sending babies to infant wards."

While the etiology and classification of pneumonia in childhood is obviously complicated and may seem formidable, this has as yet relatively little bearing on the all important matter of treatment. After all is said and done, pneumonia is pneumonia and must be treated as such regardless of etiology and classification. The pediatrician has not been vitally interested, practically, in the use of specific sera, largely because the prognosis is so favorable in the very cases in which the sera might have a favorable action if we may reason by analogy with their effects in adults. That this attitude may need to be changed in the light of newer developments is not improbable, as will be evident from the discussion by Dr. Vonachen.

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THE SHORT CUT

An ambitious young man went to a university professor and said: "Sir, I desire a course of training that will fit me to become the superintendent of a great railway system. How much will such a course cost, and how long will it take?"

"Young man," replied the professor, "such a course would cost you $2,000 and require 20 years of your time. But, on the other hand, by spending $300 of your money and three months of your time you may be elected to Congress. Once there you will feel yourself competent to direct not one but all the great railroad systems of our country."

SYMPTOMATOLOGY AND DIAGNOSIS OF PNEUMONIA IN CHILDREN

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The diagnosis of the different types of pneumonia in children requires consideration of most of the symptoms and other diagnostic features of this disease in the adult, but certain additional factors present themselves in the child. Not only are symptoms and actual physical findings in the child often different from those in the adult, but the differential diagnosis presents other conditions for consideration.

Factors of importance in discussing symptoms and diagnosis of pneumonia in infancy and childhood are numerous.

Respiration in early infancy is almost entirely abdominal or diaphragmatic, and this type predominates during the first year. Thoracic breathing develops after this. The shallower breathing means more rapid respiration and the rate in the new-born is two times that of the six year old, or even more.

The increased *pliability* of the infant's chest, as contrasted with the adult, will be obvious if one considers the cartilagenous construction of the thoracic framework, and the relatively poor turgor of the intercostal muscles and other soft tissues. This is very important; not only does it emphasize certain features such as the bulgings of effusions, and the retractions that accompany various types of dyspnea, but it also can lead into difficulty; if the child's position is not symmetrical from side to side, compression of the lungs will occur far more readily than in the adult and distortion of physical signs may be misleading.

Symptomatology of Lobar Pneumonia:

Sudden onset.

May have vomiting, or convulsion occasionally in the younger child, or a chill in the older child. Anorexia usually present.

Sickness is impressive, even if prostration is not apparent.

Fever rather high, 103 to 106.

Respiration rapid, often grunting, and ratio of respiration to pulse always increases.

Cough may or may not be severe or may be absent.

Pain is variable, dependent largely upon pleural involvement.

Drowsiness, delirium or twitchings often occur as central nervous system symptoms.

Signs of consolidation—more apparent in older child, with dullness or flatness, and bronchial breathing over the affected area. Deep breathing may be necessary to bring this out.

Râles early or late.

Course rapid, usually five or six or seven days, but variable.

Recovery rapid.

Symptomoatology of Bronchopneumonia:

Usually secondary to some infection.

Gradual onset.

Course and symptoms variable.

Child may not appear very sick.

Respiration is dyspneic.

Fever not typical.

Cough more pronounced.

More often involves several lobes.

Central nervous symptoms not so marked, early.

Signs of consolidation are less reliable—depend on distribution and size of lesions and may not be apparent on percussion and auscultation.

Râles are commoner throughout.

Course from few days to weeks, and recovery is usually by lysis.

Roentgen examination of the chest shows consolidation sometime during disease.

In the Mixed Types of Pneumonia:

Any or all of the above symptoms may be present, it is equally important to emphasize that they may be absent.

Masked or Concealed Pneumonias: are occasionally present, in which cases many days may elapse before the usual signs are detected. These are often spoken of as *central* pneumonias, but they are not always central in location, and often show peripherally with the x-ray, as a triangular shadow with the apex towards the hilus.

Symptoms of Interstitial pneumonia, with involvement of the frame-work of the lung tissues, are secondary to a careful history, showing a rather chronic illness, almost always with respiratory involvement preceding. Fever is usually mild, and the picture of lassitude and languor presents itself. Chest findings of dullness are relative; so are the râles and feebler respiratory efforts. X-ray is not diagnostic, and may show some of the features of atelectasis.

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Symptomatology of Lipoid Pneumonia:

Here again the history is very important, showing the possibility of entrance of oil into the respiratory tract, via nose drops, oral ingestion, or following vomiting of formulae. Here again the usual picture is one of a weak debilitated child, sick a long time, not thriving. It is commoner in very young children, but may occur in older ones whose cough reflex has been diminished, or who have been comatose, or aspirated oil.

Rapid respiration without dyspnea is the outstanding symptom.

A persistent and often non-productive cough is usually present.

Fever is absent in uncomplicated cases of lipoid pneumonia, but septic complications are common and a bronchopneumonia is often superimposed on a lipoid pneumonia during its chronic course of weeks or months.

X-ray shows rather constant features, usually consolidation is central, bilateral, more posterior and more extensive on the right side. In other words the periphery is apt to be clearer, because it is further from the source of supply of the etiologic factor, which follows the bronchial tree.

A lumpy appearance to the consolidation is suggestive.

The Differential Diagnosis of pneumonia involves a consideration of many conditions. We are familiar with the many extrathoracic conditions with which it may be confused; nervous symptoms often point towards meningitis; scarlet fever and other exanthem may occasionally be confusing at first; gastro-intestinal symptoms of vomiting, etc. may cloud the picture early, appendicitis is often difficult to rule out early, especially with involvement of diaphragmatic pleura, or with tympanitis and rarely, pneumonia and appendicitis occur in the presence of each other.

These intrathoracic conditions may simulate pneumonia in some respects by causing fever, dyspnea, dullness or interference with breath sounds.

Atelectasis
Hypostasis
Hernia
Collapse of Lung
Cardiac dilatation due to decompensation, following valvular diseases, endocarditis, glycogen storage, etc.
Pericarditis
Empyema
Tuberculosis
Neoplasms
Blood dyscrasias

A careful history and a complete examination will usually differentiate the lesion.

COMPLICATIONS, SEQUELAE, AND *PROGNOSIS OF PNEUMONIA IN* INFANTS AND CHILDREN

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PEORIA, ILL.

In considering complications, sequelae and prognosis of pneumonia in infants and children we all realize that these vary with the particular type of pneumonia and likewise the organisms responsible for the infection.

One thinks off-hand that it is so well known to all of us that its discussion is hardly worthy of consideration yet, one is surprised at the variations.

Pleurisy itself is associated with a lobar pneumonia so often as part of the inflammatory process that it should be looked upon as part of the disease and not as a complication.

We all know that in lobar pneumonia, except for empyema, sequelae are rare while in interstitial bronchial pneumonia they are more frequent. Likewise in children, lobar pneumonia gives usually a favorable prognosis, except in small infants, while in interstitial bronchial pneumonia the prognosis must always be more or less guarded.

Pneumococcus pneumonia has most frequently as its complication otitis media but it is not always proper to classify this as a real complication, because of the fact that pneumococcal infection of the middle ear occurs independently of pneumonia. Trask[1] states that otitis media was noted in 30% of his type 1 pneumococcus pneumonia, in 47% of his type III and 29% of the miscellaneous pneumococcal pneumonias. In his series there were only 2 cases of mastoiditis.

Of what value are blood cultures in prognosticating the early occurrence of empyema? Again in Trask's series empyema developed in 60% of the children who had positive blood cultures and in about 10% of those with negative cultures. This of course refers to type 1, pneumococcus pneumonia.

Empyema following lobar pneumonia usually begins several days after the crisis but it may occur during the disease. The first evidence is

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usually a change in the physical findings in the chest. The bronchial breathing is replaced by distant breast sounds and the dullness is superceded by a flatness. There is not sufficient accumulation in the pleural sac to make the diagnosis and our attention is drawn to it by the fact that the temperature has not returned to normal or again a remittent or intermittent temperature may make us suspect this condition.

Among a group of 47 cases of pneumococcus empyema there were 5 deaths and in each fatal case some other serious complication was present in addition to the empyema.

Otitis Media. This may develop at any time during a pneumonia. The temperature may go high without any apparent reason as there may be an otitis without pain. No cause may be found for the pyrexia until an otoscope reveals the bulging drum. Likewise an otitis may be responsible for failure of the temperature to fall at the usual time or also may be due to an increased rise after the crisis. Remember in every case of pneumonia the ear drums should be examined daily.

Other purulent pneumococcus complications were pericarditis, peritonitis and meningitis. These complications in the majority of instances were fatal.

If convalescence is prolonged, occasionally one may see a cerebral thrombosis with hemiplegia. One also sees bronchiectasis following this type of pneumonia but you can nearly always get a history of predisposing whooping cough prior to the pneumonia when this occurs.

Pericarditis. Likewise an infrequent complication. However it does occur and is usually overlooked, being most frequently found at post mortem examination revealing either serous or purulent fluid in the pericardial sac. It should be suspected when the child fails to improve after the crisis.

Pneumococcus Peritonitis. I mentional this briefly only to state that it may develop secondarily following lobar pneumonia and differs very little from any other type of peritonitis.

Meningitis. Convulsions which develop late should direct attention to a possible meningitis as a complication, especially if there is vomiting, slow irregular pulse, change in pupil reflexes and stupor. Of course a lumbar puncture should be made and the findings are usually cloudy fluid under pressure with increased globulin, high cell count and on stain and culture the pneumococcus is invariably found.

Myocarditis occurs where there is a very virulent organism with a very high temperature. The heart then becomes extremely irregular. The first sound is weak and lacking in distinctness but usually there is no cyanosis.

Endocarditis. This is as a rule infrequent after lobar pneumonia but may appear during the disease. Unlike endocarditis following other conditions there is usually some precordial pain and on auscultation an endocardial murmur. Again I emphasize in pneumonias the heart should be examined daily.

Pneumococcic Septicemia. It is by this means that the organism in the blood stream may localize in the endocardium, joints, meninges and peritoneum. A blood culture taken before localized symptoms develop may demonstrate the organism.

Abscess and gangrene of the lung. They are closely related, give the same symptoms and only with difficulty can be differentiated during life. The pneumococcus being a pus forming organism, it would seem rational for an abscess of the lung to be more frequent than is observed. Of course an abscess would follow the rupture of an empyrema into the lung. In these cases the leucocyte count remains high and if gangrene exists there is a characteristic odor to the sputum. While x-ray examination may cast no particular diagnostic shadow yet it will help us differentiate from an empyema or a tuberculosis.

Arthritis and Parotitis. These are also not frequent after lobar pneumonia yet I mention their possibility of development, although any infectious disease may be followed by an arthritis.

In contrast what about the complications after bronchopneumonia? In their order of frequency they are otitis media, vomiting and diarrhea after gastrointestinal complications and empyrema. Pulmonary tuberculosis, meningitis, pericarditis and nephritis may be found in a small per cent. of cases. On the other hand after bronchopneumonia pulmonary abscess is a frequent complication but is rarely diagnosed except at autopsy and may be responsible for the high mortality in this disease in infants.

After bronchopneumonia remember that a paroxysmal chronic cough which as time goes on is accompanied by the production of large quantities of sputum is suggestive of bronchiectasis.

Emphysema is rarely detected by physical examination but is frequently found at autopsy following bronchopneumonia.

If we consider this subject from the standpoint of influenza, bacterial bronchiolitis and pneumococcus pneumonia we have again a slightly different array of complications and sequelae. In this condition it is so usual for râles to persist for a considerable period after the fever disappears that delayed resolution might be termed a feature of both diseases rather than a complication. Usually signs persist into the 4th week of the disease. In 17% of bronchopneumonias and in 16% of cases of influenzal bronchiolitis, otitis media is the most frequent complication, occurring close to 50% in all cases of bronchopneumonia and in 38% of the cases of influenzal pulmonary infections. Again mastoiditis occurs only rarely and then nearly always due to a hemolytic streptococcus as a secondary infection.

Characteristic of the influenza pneumonias is the tendency towards relapses which occur in about 35% of the cases and it is interesting to observe in the literature that obstructive laryngitis occurs in about 8% of the influenza pneumonias in children and that the mortality rate is unusually high when this occurs even when tracheotomy was performed. In these cases it afforded only temporary relief. Empyema, subcutaneous emphysema and bronchiectasis are less common in these types of pneumonia.

If we consider the subject from a standpoint of hemolytic streptococcus pneumonia we find empyema occurring quite frequently and with a mortality rate of approximately 50%. In these cases the fluid is usually thin and contains streptococci by direct smear and it is assumed that the complication itself does not increase the gravity of the situation but that there are more deaths due to the general severity of the disease. Again in hemolytic streptococcus pneumonia when pericarditis or peritonitis occurs the result is usually fatal. Otitis media occurs in about 25% of these cases.

In a study made in an infants' home by Barenberg, Green and Abramson,[2] there were 505 cases of pneumonia in this group and 74 deaths; 214 of these cases occurred between the ages of 1 and 1 years and there were 33 deaths in this age group. Jones[3] showed that a high death rate in children under 5 years from pneumonia was coincident with the 1918 influenza epidemic; a fact contrary to the idea that influenza in children is a mild disease. We have always felt that measles and influenza are the most important predisposing illnesses as relates to mortality in children. Those now studying the types of pneumococcus contend that the type 1 pneumonia when seen in uncomplicated pneumonia had a comparatively low mortality; therefore we would conclude that the things that make for a bad prognosis are the presence of hemolytic streptococci, staphylococci and influenza bacilli. The first two can be demonstrated in the pleural exudate. Pure pneumococcus empyema carries usually a mortality rate of about 12%. We all know from the clinical experience that remarkable recovery occurs in pneumonia and it is particularly hazardous to prognosticate death. The outlook after whooping cough particularly with high leucocyte counts is bad and pneumonia occurring in rachitic and malnourished infants should be considered grave.

Generally speaking, the course of lobar pneumonia is quite stormy yet the outcome is favorable in most cases. When the fall in temperature comes there is a marked improvement in the clinical findings. Resolution takes place quickly and unless there is a delay as evidenced by physical examination, there is no damage to the lung. If, however, the consolidation is persistent after the fall in temperature, it may be months before the lung returns to normal. Those cases of lobar pneumonia that terminate in death have as a rule a soft compressible pulse and a definite tendency toward coldness of the hands and feet. This is always a bad prognostic sign because it is evidence of cardiac fatigue.

It occurs particularly in those cases involving more than one lobe where the child dies of respiratory failure and where there are varying degrees of cyanosis, the typical slate color imparted to the entire skin surface more marked about the lips and fingernails. Should the child recover from its pneumonia after complications develop they will, of course, hold the prognosis in suspense.

In bronchial pneumonia our prognosis is naturally not so optimistic. First of all because the disease occurs most frequently in infants and very young children and again because bronchial pneumonia is so frequently a secondary complication of some other severe illness. The physical

condition of the patient also alters the outlook. Those who are vigorous and healthy are more apt to recover and again the prognosis depends on the nature of the primary disease causing the bronchopneumonia. We all know of the gravity of bronchopneumonia following pertussis, measles, tuberculosis and diphtheria. The time of the year should be taken into consideration. More deaths occur in the cold months of winter and early spring. If the infant is blessed with good digestive organs, the nutrition is easily maintained and it has a much better chance. I do not believe statistics are of much value particularly if they are taken from institutions where the mortality rate in bronchopneumonia is much higher than in cases treated at home. You will find that they vary from 30 to 75% under varied circumstances. I also regard as a dangerous sign a temperature which remains low in a child that is seriously ill because it indicates an overwhelming infection which prevents the natural reaction of fever. In bronchopneumonia the virulence of infection may be such that death can occur at the end of a few hours or the inflammation may be protracted for weeks. The outlook is most hopeful in those terminating during the second week which is of course in contrast to the crisis of lobar pneumonia which occurs from the 3rd to 7th day.

Recently I have followed with interest the work of Bullowa[4] in the Harlem Hospital in New York because of its relationship to type 14 pneumonia and I wish briefly to show what conclusions he arrived at in regard to this particular type and also how antiserum influenced the prognosis in his cases. He studied 547 cases of pneumonia in children and found type 14 in 16.1%.

Slide 1 shows the annual incidence of cases in each of six years.

Slide 2, in Figure 2, which contrasts, in the five and one-half year period from July 1, 1928, to December 31, 1933, the frequency of Type 1 and Type 14 by year of age, it is shown that before puberty Pneumococcus Type 1 and Pneumococcus Type 14 are about equally frequent, and together they cause about 31.3% of the pneumococcus pneumonias in children. There is a marked difference in their selection, however; whereas Type 14 causes one-fifth of the pneumococcus pneumonias during the first three years, after age six it occurs less frequently than Type 1. The childhood mortality for Type 14 is much greater than for Type 1. For Type 1 it is 6.4%; for Type 14, 16.1%. Children of four or five years of age either meet new exposures in the street, the day nursery and the school, or have a changed susceptibility, which latter fact may account for the difference in the organism causing the pneumonias. After infancy Type 14 surrenders its dominance to Type 1, though it does not yield its lead in fatality.

Slide 3 shows the distribution of age incidence-first total number of cases and then separately for both lobar and bronchopneumonia.

Slide 4 shows results of serum. Treatment in adults and children for Type 14. Note particularly the improved percentage of recoveries in those receiving serum.

Slide 5 shows temperature chart, mode of giving anti-serum and pulse after administration of anti-serum.

Slide 6 shows temperature chart of an eleven month marasmus infant admitted on first day of pneumonia, treated on the second day, crisis came on third day with agglutination on fourth day. Type was obtained by lung suction. Two intramuscular injections of 5,000 units each were given on 2nd and 3rd days, twelve hours apart.

Bullowa summarized as follows his work with Type 14: It is a virulent organism for human beings, selecting by preference infants and young children, in whom without anti-serum the pneumonias are usually of long duration. Upon recovery agglutinins appeared. When sufficient anti-serum was given in Type 14 there occurred defervescence and earlier recovery.

Conclusions: Improved prognosis in infants and children, particularly as to Type 1 and 14 by means of lung suction and administration of proper anti-serum as soon as this is more available and its cost is not prohibitive.

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THE TREATMENT OF PNEUMONIA IN CHILDREN

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Prophylaxis. Pneumonia in children is usually preceded by an upper respiratory infection such as the common "cold," bronchitis, grippe, "flu" or whatever you might call it, frequently accompanied by several days of mild fever. The question arises: Is it possible to forestall the pneumonia. I believe that it often is possible. The sudden recrudescence of fever and severe symptoms ushering in the pneumonia usually occur after a day or two of normal temperature following the insidious febrile grippal infection. Consequently, especially during the pneumonia season, the acutely febrile child should be put fully and completely to bed, not always an easy task to carry out in younger children, who will not voluntarily remain in bed unless desperately ill. Bed should be insisted on until the temperature has been normal (rectally under 100°) for at least two or three days to avoid this so-called relapse. Generally speaking, bed rest is best continued also until the appetite returns, as until then convalescence is not well established.

Chilling should be carefully avoided by providing warm enough bed clothes, etc., and especially if a bed pan is not used, the child should have warm foot covering and be dressed with a robe or blanket before being carried to the toilet.

It is very important to prevent secondary or superinfections by isolating the patient from all children and most adult visitors.

Active Treatment. If pneumonia develops in spite of these precautions, or if already present when the child is first seen, I believe most of us realize that it is a self-limited disease, mostly running a favorable course in children, and should not be over-treated. There are, however, factors in therapy that undoubtedly tend to promote a favorable outcome, especially in the more seriously ill.

Rest, both physical and mental, cannot be overemphasized. Cough, pain and delirium should be controlled sufficiently by hydrotherapy and sedatives to assure rest. Mental rest can be obtained by not overtreating, especially with relatively nonessential procedures that may frighten and disturb the child. Even the nurse should disturb the patient as little as possible and not be overzealous about keeping the bed in order, the patient clean, his teeth brushed and his hair combed, if these procedures annoy him, while he is seriously ill. However, his position should be changed from time to time and infants should be held part of the time. Incidentally, the infant's shirt should not be tightly pinned to the diaper, as respiration is definitely interfered with thereby. Visitors and even near relatives in the sickroom should be reduced to the minimum, especially if their presence induces excitement.

Temperature of the Room. Inasmuch as most young children with pneumonia have had a preceding or associated bronchitis, moderately warm, moist air provides the greatest comfort. Fresh air without draft is also essential. This ideal of fresh, moist, warm air can be obtained, even during the winter, by opening the window moderately behind a screen or ventilator, keeping the radiator turned on but covered with a wet towel, or hanging wet sheets about, or boiling water in the room off and on to provide moisture. Occasionally the child, if not too sick, can be carried into another room while the sickroom is being thoroughly aired, and the fresh air warmed before returning the child.

Diet. The child with pneumonia usually loses his appetite completely, vomiting is frequent at the onset and constipation is the rule. Serious ketosis and disturbances of mineral and water metabolism occur easily. Fluids and easily assimilated carbohydrates are essential during the acute stage of the illness to combat toxemia, dehydration and ketosis and to promote diuresis. The little patient will prefer drinking to eating, especially during the first few days. Inasmuch as the child has no appetite, he will only take the foods that he normally likes a great deal. Fortunately these are the easily digestible carbohydates, namely, custards, jellies, junkets, honey, malted milk, ice cream, simple cookies, lump sugar, hard candies, crackers, etc. These foods also cause increased thirst because of their sweetness, which promotes the desire for fluids, such as sweetened fruit juices, sweetened tea, ginger-ale, broths, milk, etc. Salty crackers, which children like, also promote thirst. When vomiting is present, milk will often aggravate it, but in the absence of vomiting or tympanites, milk

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provides an excellent and well taken food. Skimmed milk is preferable, as fats of all kinds are wisely restricted in the diet because of the slower emptying time of the stomach during febrile states. It is not a good plan to force the child to eat, as it frequently only results in vomiting and may lead to a persistent anorexia. Most children, not too sick, fed small amounts frequently, with a little coaxing will take enough simple carbohydrates and fluids to tide them over the acute febrile days. As soon as the child's appetite returns, and it usually comes back with a "bang" during convalescence, the child may have a full diet, providing there is no gastrointestinal contraindication.

Fluids. The usual order given to the attendant is to force liquids. This can be greatly overdone. It may considerably disturb the child's much needed rest, because of frequent awakenings to administer fluids and more awakenings to urinate them. Besides, it may lead to vomiting, when more fluid will be lost than is taken in. A very simple method available to the attendant, to judge whether a child has had sufficient liquid is not alone to measure the actual amount imbibed or excreted, but to observe the color of the urine. If the urine has its natural light yellow color, enough fluids are being taken; if a deep amber color, not enough fluids are being taken and if the urine looks like water, too much fluid is being forced. Seldom is it necessary to administer fluids in any way except by mouth, so long as the urine retains its normal color. The physician can more scientifically determine whether the child is receiving sufficient fluid by determining the specific gravity of the urine.

In the more severe cases, when the child continues to vomit or have severe diarrhea or is too dyspneic or too sick to take adequate fluids by mouth, the intravenous gravity drip is life saving. This is a relatively easy method of administering fluids once the technique is mastered, and much less painful and annoying to the child than the subcutaneous route. When dextrose and fluid are urgently needed, as in collapse, ketosis, anuria, etc., the intravenous method is the one of choice. In older children an arm vein can fairly easily be punctured, and in younger children an ankle vein just anterior to the internal malleolus of the ankle can easily be dissected out. Of course, all apparatus and solutions must be especially prepared for intravenous injections. The usual fluids given are 5% or 10% dextrose in normal saline or Hartmann's or Ringer's solution. The drip should average about 40 to 60 drops a minute, which will not overwhelm the circulatory system with sudden large increases in the water content of the blood. The output, color and specific gravity of the urine are again the guide as to the amount and rapidity of the injections. Avoid giving too much fluid.

When intravenous fluids cannot be given for whatever reason and parenteral injections of fluids are necessary, the subcutaneous route may be employed, preferably in the thighs, by gravity in older children, by syringe injections in infants—never in the chest, abdomen or back areas in cases of pneumonia. Normal saline and Ringer's solution are rapidly and well absorbed, while dextrose solutions are slowly and poorly absorbed subcutaneously. These subcutaneous injections are usually painful to children, causing considerable restlessness and at time a local anesthetic added to the solution is advisable.

Occasionally during vomiting or refusal to take fluids by mouth, rectal administration may be attempted successfully if there are no tympanites; 5% dextrose in normal saline is used. Because of lack of cooperation this method is usually not successful under four years of age. A child of four years will retain 3 to 4 oz. every 4 hours, if the buttocks are held together for five minutes or so after the fluid is given, until the desire to expel it has subsided. The rectal drip method is not successful as a rule.

Hydrotherapy is at times a valuable adjunct. A fever that is not unduly high needs no reducing, as it is probably a valuable part of the normal mechanism for combating bacterial invasion. As we all know, a high fever in pneumonia is a better sign than a low one. If, however, the fever produces restlessness, lack of sleep, discomfort, delirium or convulsions, or there is hyperpyrexia, then measures may be instituted to reduce it. Sponging with tepid water and alcohol really has little effect on the fever, although it may refresh the patient. It may, however, subject the child to unnecessary handling, chilling and exposure. The Priessnitz, a light, tepid, wet flannel jacket about the body, enclosed in oilsilk, will often remarkably quiet a restless delirious patient and thus avoid other sedatives. It should be kept moist with tepid water. It can be left on indefinitely if the child falls asleep,

as it soon takes on the temperature of the body and eventually drys out. An ice bag can be placed on the forehead, although most children fight against this. For extreme hyperpyrexia, cold packs and cold enemas may be used very cautiously.

Drug Therapy. Drugs play a minor role in the routine treatment of pneumonia in children, but if a definite indication exists they should be used to meet it.

Sedatives are the most important group. Aspirin in proper doses (from 1 grain at 1 year of age to 5 grains at 6 years or over), may be repeated as often as every 4 hours or so and is relatively harmless. It does relieve pain and discomfort, thereby promoting essential sleep and appetite. Alkalies, as the citrates, said to be of value in febrile conditions, can be combined with the aspirin. If the cough, pain and restlessness cannot be controlled by aspirin and hydrotherapy, then barbiturates may be prescribed or narcotics such as paregoric, codeine or even morphine to secure the essential life preserving rest. In fact, morphine may be a most valuable drug during a severe pneumonia, when quiet is very essential to life. Doses just sufficient to quiet the child should be used, i.e., gr. 1/12 in an 8 year old. It should not be used when there is much respiratory depression and breathing is an effort.

Stimulants are rarely necessary except in collapse, when adrenalin, hypodermically, in doses of 2 to 5 minims, is the most effective in bolstering the failing peripheral circulation and blood pressure. Caffeine sodium benzoate is also an excellent stimulant, but if used over any length of time may increase the cerebral excitement. Coramine is valuable. Whiskey is used by a number of good clinicians, especially in young, weak infants and asthenic children. Aromatic spirits of ammonia on cotton, held before the nostrils, often is a quick way to overcome a sudden cyanotic attack.

Expectorants. When the secretions are tenacious and there is much coughing, any one of a number of expectorants may be used, such as syrup of ipecac, ammonium chloride, guaiacol and later during convalescence the iodides. Atropin is usually contraindicated, except in a very wet pneumonia or edema of the lungs, as it thickens up the already tenacious mucus, thereby promoting a blocking of the bronchi, with resulting atelectasis.

Local applications such as counterirritant ointments, mustard plasters, etc., have been largely discarded, although occasionally in young children a mustard poultice seems to give some relief.

Cathartics. A daily evacuation is desirable and this can be accomplished by a mild laxative such as milk of magnesia, an enema or suppository, often depending on the mother's or child's preference. In fact, an enema every other day suffices if there is no tympanites, as there is not much residue as a result of the anorexia. Frequent enemas every few hours to combat fever are both useless and harmful. Drastic purging with castor oil, calomel or salts is definitely contraindicated and is weakening and disturbing to the child.

Tympanites calls for special consideration, as it is a manifestation of toxic ileus and is a grave sign. The upward pressure on the diaphragm is an added handicap by decreasing the available air space in the thorax. Ordinary enemas or the rectal tube and stupes may suffice, but when marked, the 1-2-3 enema consisting of 1 ounce of glycerin, 2 ounces of magnesium sulphate and 3 ounces of water is very valuable. Pituitrin hypodermically is of value, from m iii to xv, depending on the age of the child. Occasionally the intraperitoneal injection of this drug is lifesaving. It is well to avoid milk in the diet when tympanites are marked.

Oxygen has a definite place in the treatment of pneumonia in children. Oxygen should not be used just as a last resort for the benefit of the family nor should it be used unless a definite indication exists. The child with the ordinary pneumonia, who is comfortable and shows no respiratory or cardiac embarrassment, does not need oxygen. There is nothing specific about oxygen therapy other than its relief of anoxemia. Consequently, dyspnea or cyanosis are its best indications in children.

The tent method is usually much less distressing to the child than administration by nasal catheter, especially if a familiar plaything that the child has an effection for is also placed in the tent. Usually a 50% concentration of oxygen is started, and then as the disease subsides it is gradually reduced to 20% before removing the tent. The child should not be removed from

the tent for unimportant things and subjected to the great shock of abrupt changes in oxygen tension, with the resulting sudden demands placed on his circulation. The temperature in the oxygen tent is usually cool and the child may need warmer bed clothing.

The nasal catheter method also has its advantages. It is more economical and permits better examination of the patient, therapeutic procedures and nursing care without changing the amount of oxygen inspired.

Blood transfusions are not indicated in the ordinary case of pneumonia. However, in certain cases of pneumococcus pneumonia which are alarmingly toxic or in shock or collapse, a small intravenous transfusion of properly typed and matched blood seems to benefit them considerably and is apparently without harmful effects. In the mixed infection pneumonias, when they are prolonged into the second week, as they often are, blood transfusions often seem to definitely start the patient toward recovery. In previously debilitated, anemic, malnourished children, often just recovering from a preceding contagious disease or those with low grade protracted pneumonias or sepsis, the supportive value of transfusion is certain, whatever the immunologic value may be. The danger of cardiac dilatation and overload can be avoided by giving slowly only relatively small amounts of blood.

Specific Therapy. Specific immune sera such as Felton's Type I antipneumococcus serum has not been used extensively in the treatment of pneumonia in children. First, because most pneumonias in children are not caused by the Type I pneumococcus, and secondly, the very favorable outcome in lobar pneumonia in children, the kind most likely to be caused by Type I. Another reason is the comparative difficulty in obtaining sputum from a child, as they do not expectorate. To stick a swab into the larynx of a desperately sick child is not an ideal therapeutic procedure. However, if the child is desperately ill with a pneumonia proved to be Type I, II or VIII, there is certainly no special contraindication to specific therapy.

Convalescent serum has also been used, but no definite conclusions can as yet be drawn as to its value. Here again the typing is essential, and if convalescent serum corresponding to the type pneumococcus is available, no harm can result from its use.

Hospitalization. Every case does not need hospital care. However, in severely ill pneumonias so many more life-saving procedures can be accomplished, if necessary, in a well-equipped hospital that I believe that is where this type of child belongs. He should, however, be carefully isolated from his neighbor for mutual protection from crossed and superinfections.

It goes without saying that complications of pneumonia, especially otitis media and empyema, should be carefully watched for and treated as and if they arise. The allotted time, however, does not permit a discussion of the treatment of the complications of pneumonia in children in this paper.

DISCUSSION ON SYMPOSIUM ON PNEUMONIA IN CHILDREN

Dr. Scott J. Wilkinson, Decatur: I think the subject has been very well covered. There is one thing that has interested me and that is the trend of the discussion toward the etiological viewpoint. I would say that in the past pneumonia has been more an anatomical diagnosis than anything else. Nobody would talk about meningitis today without distinguishing the type considered. In contrast appendicitis is still a regional diagnosis which may not remain so in the future. While the etiological aspect of pneumonia does not have much practical importance now, it may have greater therapeutic value later with advances in specific chemotherapy and sera.

One other thing I wonder about. There must be many mild, atypical pneumonias which are missed without x-ray study because the patients are not ill enough to require hospitalization. When diagnostic x-rays of the chest are taken among the sicker patients during an epidemic of upper respiratory infections it is often surprising to see the amount of lung involvement encountered in the absence of definite physical findings and clinical behavior suggestive of pulmonary disease. Possibly the recognized cases of pneumonia represent the severe types of pneumococcus, and certain other infections occurring during the age of primary exposure to endemic bacteria.

Dr. Frederick Maurer, Peoria: There are just a few points to which I should like to call attention. The leucocyte count, as we all known in lobar pneumonia and the other pneumonias, but particularly lobar, is apt to be high. I do not believe it was mentioned what the leucocyte count might be in the interstitial type of pneumonia or whether or not there was a leucocyte count over normal in the lipoid type of pneumonia.

In speaking of pneumonia in adults, we are often impressed with the occurrence of labial herpes, and I would like to know how often this is a diagnostic sign in children.

We have been told that lobar pneumonia occurs most often in children over three years of age, but I am

under the impression that I have seen some lobar pneumonias under that age and even under the age of two. I would like to know whether or not there is a certain percentage of lobar pneumonia which occurs under the age of two years. Bronchopneumonia occurs most frequently we know under the age of three years.

One of the speakers has brought out the symptom of irritability of the patient in the two types of pneumonia, the lobar type being the type in which less irritability seems to occur; the patient lies there more or less relaxed. In the adult type of lobar pneumonia much stress has been placed upon the symptom of expectoration. No stress can be placed upon that, I believe, in discussing the symptomatology of lobar pneumonia in infants. I have never seen a patient expectorate very much until he was four to six years of age. I have noticed in my cases of the lobar type that the child will frequently curl up on the affected side, and if you want to know which side the pneumonia is on, just roll him on the other side and it will set up an irritability and the patient will start to cough and you can be sure you have pneumonia on the upper side.

Speaking of collapse, in the differential diagnosis I believe it should be brought out that this collapse does occur to some extent following surgical procedures under inhalation anesthesia on other parts of the body. I have seen patients come from the operating room and within twenty-four hours exhibit symptoms of rapid respiration and dyspnea and upon fluoroscopy and x-ray we have been able to demonstrate collapse of one or more lobes of the lung.

I believe the other points in the diagnosis and symptoms have been adequately covered.

Dr. W. M. Whitaker, Quincy: Dr. Vonachen has so beautifully covered his subject that I hesitate to say a great deal. However, there are a few points that deserve some stress. The complications of pneumonia are of great importance because, as many men have said, it is upon the occurrence of these complications that the outcome depends. As Dr. Vonachen has said, otitis media is the most common complication. One point about this which we should stress. Due to the head retraction and slight stiffness of the neck the physician feels that he may be dealing with early pneumococcus meningitis. Another confusing condition is meningismus. We see this not uncommonly in lobar pneumonia, particularly in the right upper lobe. Careful examination of the tympanic membrane and spinal puncture will prove or disprove the presence of these conditions. The importance of empyema has been emphasized rightly, but there are some points about this condition which can stand more stress. It has been my experience to see in many cases of lobar pneumonia, particularly the type seen in younger children, a rather large purulent effusion, frequently occurring early in the course of the disease and known as syn-pneumonia empyema. This is important because treatment must be conservative. It is one type in which the old slogan "Be early to aspirate and slow to operate" is very wise. This represents a generalized infection of the lung and pleura. In addition, the individual case may develop a pneumococcic peritonitis; that is important but very rare. Rolleston collected only eleven such cases in a series of 4,000 cases of pneumonia. It adds a great deal of gravity to any case. As you know, the symptoms may be very confusing and, due to the fact that many children have a great deal of tympanites, the diagnosis is very difficult. In some of these cases where the condition is suspected, it is valuable to do a pritoneal puncture. It is well to say that the treatment for this condition is primarily conservative, delaying any surgical procedure until localization of the pus in the peritoneal cavity occurs.

I was glad to hear of the importance of type 14 pneumonia. As Dr. Vonschen brought out, this type 14 has been shown to be particularly important in children under six years of age. The majority of pneumonias we see in older children are types 1 and 2.

I think in conclusion that the prognosis of pneumonia in children depends upon several factors. First of all, the age of the child is of primary importance. All investigations show that children under two years of age have two to three times higher mortality rates, regardless of the type of pneumonia or infecting organism. The type of clinical pneumonia resulting is very important in the prognosis. Fortunately the mortality of lobar pneumonia in all ages of children approximates only one-half that of bronchopneumonia. The third point has to do with the type of infecting organism present and the fourth, and one of the most important in any child, depends upon the detection and recognition of the importance of complications and the physician's ability to alleviate properly these complications.

Dr. King Woodward, Rockford: I think that the home care of the normal pneumococcic pneumonia should be stressed. There we have less agitation from interns and nurses and the average remedies can be administered.

I would like to take exception to Dr. Calvin's remarks about the oxygen tent therapy in treatment of pneumonias. I feel that his remarks are very true in the child under three years of age but I think that the nasal catheter administration is as efficacious, if not more so, in the older child. It is less expensive and lessens disturbance to the child and after the first few hours he becomes accustomed to it and I feel that it is very valuable. As many as eight or ten liters of oxygen can be given to the patient, according to his needs.

Another point which has not been brought out in this discussion is that the blood chlorides are depleted. I have found that a salt cocktail may be given by mouth which will increase the reserve of the blood chlorides by using 1 teaspoon of table salt with two lemons, six oranges and six teaspoonfuls of sugar and diluting with various beverages, such as ginger ale, up to two quarts.

There is another remark I meant to make about oxygen therapy. It is very important that the nasal catheter be properly applied. You must be sure that there are multiple holes in the catheter and that the tip of the catheter is just seen in the pharynx and not projecting down to cause swallowing of air. At the University of Wisconsin they have a unique set-up. The oxygen tanks are stored in one building and the

oxygen is piped across the street; they tap the oxygen from outlets in the walls and they employ oxygen very extensively in many conditions.

In closing I should like to emphasize the importance of complete mental and physical rest with maintenance of body fluids and oxygen and other therapeutic measures to be given symptomatically.

Dr. Frank E. Inks, Princeton: I would like to emphasize the fact that if a little care is given with the intranasal use of oxygen, most children will handle it well. In the town where I practice we do not have a tent but by being careful we have saved the lives of several children by using the nasal catheter.

I am glad to have heard about the giving of salt. It has been my custom to give most children a salt drink. They will take a pint of water with salt in it where they will not take plain water.

Dr. E. T. McEnery, Chicago: Some of the cases reported today should not be classified as unresolved pneumonias but as a pulmonary condition in a prebronchiectatic stage. If bronchoscopic examination and drainage were used you could prevent this case from developing bronchiectasis a few months later.

Dr. Gerald Cline, Bloomington: I am sure we are all agreed that this morning's discussion has not only been a grand review but that it has emphasized many of the newer important phases in the diagnosis and treatment of pneumonia in children. The discussion on lipoid pneumonia especially was of interest to me. I know in the past I have stumbled over this diagnosis on several occasions. Quite often we do not advise x-ray because of finances but it seems that this procedure if carried out more often will help clear up some of our perplexing dyspneic and cyanotic attacks seen in the very young.

Apparently no one has mentioned the asthmatic child with his picture of dyspnea and cyonosis, specially in regard to the differential diagnosis of pneumonia. Quite frequently, especially in the fall months, we see little Johnny who has kicked and played in the dusty and smokey leaves on his way from school, suddenly become ill with high fever, croupy cough, dyspnea and wheezing and even acute pain in the chest with numerous mucous and musical rales throughout both lungs. Of course, these symptoms might very well suggest oncoming pneumonia, but with epinephrine, warm air and steam, in a few hours or at any rate the next morning, Johnny again presents the picture of a well child. Recently, I am qiute convinced that this same clinical picture does occur in very small infants as well. Naturally the child whom we already know to be allergic is much oftener the victim.

In behalf of the officers of this conference I wish to thank all the participants in this very timely program.

Dr. Joseph Brennemann, Chicago (in closing): I would say that perhaps my remarks were misunderstood, because uncomplicated lobar pneumonia can occur at any age; it is the typical pneumonia.

I am very much interested in otitis media in connection with pneumonia. One of our men does practically nothing for these ears and I feel a good deal the same way.

I agree with what has been said about home treatment of these patients and think it applies also to a good many other things. A children's hospital is a good place to keep children out of, unless they have to go there for something which cannot be taken care of at home or in an outpatient department .

Dr. W. L. Crawford, Rockford (in closing): I wash to thank Dr. Maurer for directing our attention to the leucocyte count in different types of pneumonia. It certainly should not be overlooked. There is a marked leucocytosis in the acute forms of broncho- and lobar pneumonia, and there is a leucopenia in those children in whom the hematopoietic system fails. The interstitial pneumonia has a milder leucocytosis as the drain on the bone marrow is not as high as in the acute forms. The lipoid pneumonia is not an infective process; it is an artificial process and a leucocytosis is not necessarily a part of it, but it is a rare case that during its course, in these asthenic youngsters, does not have a complicating infection of the upper respiratory tract and as a result a complicating leucocytosis of milder degree, but leucocytosis is not a part of the lipoid pneumonia itself.

As to the question of herpes, I think herpes in a lobar pneumonia is a quite common accompaniment. It is not as common in bronchopneumonia.

Dr. John R. Vonachen, Peoria (in closing): I think we should not let the internists steal our smoke in regard to the typing of pneumonias. After all, we have more material on hand than probably any other group and we should avail ourselves of the opportunity and not adopt the attitude that most of these children get well. Even if the prognosis is good, we can better it a lot if we take an interest in the type.

Dr. Joseph K. Calvin, Chicago (in closing): I would like to say a few things in closing. Regarding home versus hospital care of pneumonia, I do not want to leave the impression that all these patients should be hospitalized. Many of them should not be. When the patient is quite ill and requires special treatment, such as oxygen, parenteral fluids, blood transfusions, etc., I think, if he can be properly isolated in a good hospital, the facilities for watching him are so much better there, that that should be done. The ordinary pneumonia can be satisfactorily handled at home, but one must watch for anything of serious import, and when that occurs hospitalize the patient immediately, if this can be done safely.

Regarding the nasal catheter versus the oxygen tent, both are very valuable. I think it is easier for an inexperienced person to use the tent because, unless the catheter is employed properly, the child will swallow the oxygen instead of inhaling it. My general impression is that these children are more comfortable in a tent, and are more rapidly relieved of dyspnea. I know that at the University of Wisconsin they use the catheter method a great deal and have had good results. At the Cook County Hospital we cannot provide tents for all the children, and the catheter is a life-saving measure.

Regarding the low blood chlorides, I have never added salt to the liquids taken by mouth, but I have

advised eating salty crackers. This will also increase thirst, and the children will drink more fluids.

Regarding treatment of some of the complications, Dr. Whitaker pointed out that empyema during the acute pneumonia should be treated by aspiration rather than by more radical surgery, if possible. I agree with Dr. Brennemann about the conservative treatment of otitis media complicating pneumonia. I feel that pneumococcic peritonitis should not be operated upon until there is localization of the pus.

Regarding moist air, I feel that many of these cases start out as a bronchitis and we know that warm moist air is soothing for that type of infection, but we must warn mothers and nurses not to overdo it.

SADDLE NOSE

A Report on the Use of Ivory and Cartilage Implants

SAMUEL SALINGER, M. D.,

CHICAGO

In 1931 I published my results in a series of 50 patients in whom ivory was used for the correction of saddle or flat nose. Since that time I have used this material in 65 additional patients and am satisfied that the method is safe and will yield lasting results if properly done. The very first patient in whom I had used ivory in 1925 still retains the implant in its original position and reveals neither the slightest sign of a foreign body reaction nor evidence of deterioration of the ivory. (Gluck[1] showed a case where ivory was retained for 30 years.)

It is not my purpose in this paper to enter into a controversy as to the relative merits of costal cartilage and ivory nor to decry in any manner the value of the former. I admit that costal cartilage is an ideal implant material for most cases but at the same time I am convinced that the operation is not a simple one, particularly for the occasional operator. If improperly done or inaccurately carried out it will fail to satisfy the patient who will thenceforth carry upon his person not one but two scars to remind him of an unsuccessful operation. Most of my patients, particularly women, rebel against the chest incision necessary for the removal of the cartilage and gladly embrace the alternative of ivory when the two methods are explained to them. In proposing an ivory implant to a patient I present the facts as I have them from my own experience, explain the risks, the percentage of primary infection, secondary foreign body reaction, etc., so that there can be no misunderstanding. On the other hand when a costal implant is proposed one must with equal sincerity explain the necessity for an incision in the chest, the risk of primary infection in either or both wounds, the possibility of the cartilage curling or slipping because of a lateral tilt in the nose and the chances of absorption particularly of the columellar prop where it is used for the support of depressed nasal tip.

My present series of 65 cases yielded 85% successful takes. In examining the records carefully I find that there were 5 cases (7.7%) of infection (3 primary) which necessitated removal of the implant. Analyzing this group I discovered that two of them were due to the grossest kind of contributory negligence. One patient left the Infirmary on the fourth postoperative day in excellent condition and walked a distance of three miles when the temperature was 14 below zero. As a result his nose was frozen and the ivory had to be removed. In another instance the patient had had the ivory in situ for over a year with no untoward symptoms, when he also was exposed to subzero weather for a long period with a resultant frozen nose and infection which necessitated the removal of the ivory. I must admit then, that extremely low temperatures will predispose the patient to frozen nose and I would therefore not advise the use of ivory in individuals who are compelled to spend much time out of doors in extremely cold weather unless they had the means of protecting the nose. This would apply particularly to policemen, firemen and truck drivers. And yet, I know of a milk-wagon driver as well as two chauffeurs who have carried their ivory implants for three to eight years with no untoward symptoms. Aside from the two frozen noses just recorded there were 3 other cases where the ivory had to be removed because of infection. Analyzing these cases I find that the infection manifested itself within 48 hours of the operation by swelling and redness of the nose, fever and headache and that in 2 of them the operation was performed in the dead of winter. This emphasizes again a fact with which most rhinologists are acquainted, namely, that there is always a greater risk of infection in any nose operation performed in bad weather. One can never be sure that the patient even when apparently free from infection may not be harboring pathogenic bacteria in the nasal passages

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Read before Section on Eye, Ear, Nose & Throat, Illinois State Medical Society, Peoria, May 19, 1937.

or the throat which easily become activated as a result of trauma. I am firmly convinced that if I refused to do an ivory implant during the season of December to April I would eliminate practically all of the primary infections.

A second group of cases which deserve comment are those manifesting a foreign body reaction in the tissues some time after the operation

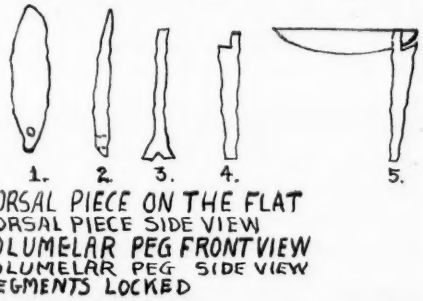

Fig. 1. Details of double ivory implant assembly.

of which there were 5 (7.7%) in my series. This condition manifests itself by a persistent redness of the skin overlying the implant and if sufficient time is allowed to elapse a fistula will form either near the extremity of the implant or within the vestibule. This fistula will discharge a thin lemon tinted secretion at intervals and will be followed by the appearance of a small granuloma at the orifice. The presence of these symptoms indicates an intolerance of the tissues to the foreign body which must then be removed. The question as to whether the ivory may be reinserted in such an individual has answered itself for me in at least three cases where the patient insisted on having the ivory replaced. This I did after allowing a sufficient lapse of time to permit a complete organization of the granulomatous lining in the fistulous tract. Since the same patient who developed a foreign body reaction at the first operation was later able to tolerate the ivory the question as to what factors determine this toleration or lack of toleration has become more of a mystery than ever. I have had the opportunity of removing ivory implants that have been successfully borne for several years (the patient being desirous of having the shape or size of the implant changed) and have been astonished to observe how firmly the ivory was imbedded. This has been particularly true of the columellar peg of the double implant which I shall describe later. In several instances the ivory was firmly encased in a bed of fibrous tissue and I found its extraction much more difficult than the primary insertion. In 4 cases the ivory was removed six months to three years after operation because the patient was not satisfied with the shape of the nose. In 3 of these cases differently shaped ivory implants were then inserted and retained without reaction. In the fourth case auricular cartilage was substituted for the ivory. In all of them the second operation was successful.

In no instance was I able to observe any gross alteration in the structure of the ivory after a definite sojourn in the tissues nor have I been able to find in the literature any mention of this possibility with the exception of a reference by Claus.[2] This author demonstrated several cases where x-ray pictures showed erosion of the implant which was later proven when the ivory was removed. I have the impression in view of the complete absence of this finding in my cases that Claus' bad results were due in large measure to the use of a poor quality of ivory. I have made

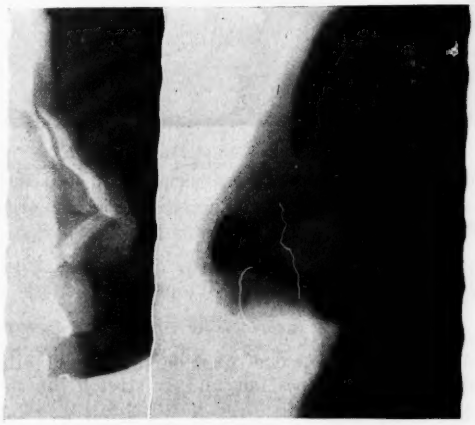

Fig. 2. (Left) X-ray picture of double ivory implants in situ.
Fig. 3. (Right) Single ivory post in place supporting the nasal tip. (See Fig. 4.)

it a rule to employ only clean fresh white natural ivory. One must reject the outermost layers of the tusk as well as samples that are in the least discolored or cracked.

As to foreign body reactions, it is my belief that the condition of the host as well as the preparation and method of introduction of the implant have a definite bearing on the incidence of this complication. Ivory should not be used for the correction of a syphilitic saddle nose nor in the presence of ozena, chronic suppurative sinu-

sitis nor in noses where the skin overlying the dorsum is not freely moveable. Also I have noted that ivory is not well borne in noses afflicted with acne or seborrhea.

As to the preparation of the implant one must be guided by the plaster model for size, always bearing in mind that the implant must be smaller than necessary to fill the defect in the model since allowance must be made for the thickness of the displaced skin. The implant must have no sharp edges and its surface should be carefully

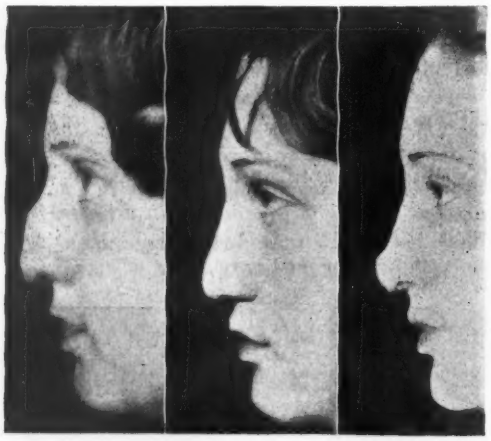

Fig. 4. Case of hump, twisted nose and deviated septum. Corrected by sawing hump across, infracting nasal bones and resecting septum. Single ivory post to support the tip.

smoothed on a buffer before it is ready for sterilization.

When a double interlocking implant is used to raise the nasal tip one must be careful that the columellar post does not unduly stretch the tissues. Too much pressure at any point will unquestionably predispose to a foreign body reaction by interfering with the circulation of the overlying skin. Also in fitting the columellar post into the dorsal piece it is necessary to see that the hole which is drilled near the end of the latter is so placed as to receive the peg of the former at a natural angle for the particular nose in question. In most cases this angle is 90° but it can be varied according to the length of the nose and angle of the dorsum to the columella.

Much depends on the method of introduction. When a single dorsal piece is used I find that a half inch incision across the root of the nose gives the best results. This incision goes through the skin only which is then elevated by blunt dissection with long narrow scissors creating a subcutaneous pocket large enough to receive the implant without unduly stretching the skin. In order to be sure that one keeps in the midline it is best to stand behind the head of the recumbent patient throughout the whole procedure. When double implants are used it is best to make a median columellar incision from the tip down to the philtrum. This incision splits the columella and extends backward into the membranous septum, care being taken not to perforate the latter. Through this incision the tissues beneath the dorsal skin are opened by blunt dissection with spreading scissors. In order to be sure the implant will not slip off of the nasal bones it is well to make the upper extremity of the pocket just large enough to receive the tip of the implant.

Fig. 5.—Single dorsal ivory implant.

The rest of the pocket may be as wide as necessary to prevent tension of the skin. The lower end of the columellar incision which receives the expanded end of the ivory post must also be opened widely with the spreading scissors, care being taken to keep fairly close to the skin at the junction of the columella with the lip and to open the tissues down to the periosteum in front of the nasal spine. Under no circumstances should the periosteum be traumatized. When the columellar post is properly inserted it should be possible to slide the columella upward without displacing the ivory. When both pockets are ready the dorsal piece is inserted first and then the columellar

piece. The two are locked by having an assistant raise the dorsal piece with a single hook inserted in the hole while the operator holding the columellar piece with a pair of tissue forceps slides it along the curve of the hook until the peg slips into the hole. The hook is then removed and the wound is closed with interrupted silk sutures. These must be tied loosely to compensate for some postoperative swelling which would otherwise cause the sutures to cut into the skin. No dressings are applied. The wound is

Fig. 6. Double interlocking ivory implants to support the tip and level the dorsum.

covered with 1% yellow oxide of mercury ointment and cold compresses employed for 24 hours. The sutures are removed in 48 hours.

It is well to have two or three small files on the tray in case the implants should prove too large. Last minute reductions in size may be safely done if they are not too extensive, although I find that careful measurements in advance will obviate the necessity for such correction.

In answer to the question as to whether I restrict myself to ivory in all cases of dorsal depression let me say definitely "no." I use costal cartilage in the group mentioned above as being contraindications for ivory and I employ auricular cartilage for small defects. The technique for the former has best been described by Sheehan[3] in his latest book on Rhinoplasty and is worth reading. The technique of doing an auricular implant has not been described in any textbook with which I am familiar and therefore merits a few explanatory lines. Since the cartilage of the ear is rather thin one cannot expect it to be adequate for filling a large dorsal defect, but where the depression is slight it serves admirably. One may safely remove one or two strips of cartilage not exceeding an inch in length and a quarter inch in diameter without impairing the shape of the auricle. The incision is made along the back of the concha parallel to and about a quarter of an inch from the postauricular fold. The pericondrium will be found to be very adherent in this location and must be carefully peeled off by sharp dissection before incising the cartilage. The incision in the cartilage must also be done with delicacy lest one perforate the skin in the concha. It is well to have the pocket which is to receive the implant prepared before working on the ear and this is done through a vertical incision in the tip of the nose and dissection of the skin of the dorsum. I find this procedure much simpler than any intranasal incision because the pocket is strictly subcutaneous and the implant is introduced above the columnar cartilages which are in no way disturbed. After removing the strip of cartilage from the ear it should be examined to see that no perichondrium remains attached since this tissue will tend to curl the cartilage. If the cartilage bends slightly it should be nicked with a sharp scalpel to overcome this tendency. It is then inserted into the prepared pocket and the incision closed with two fine silk sutures which are removed in 48 hours. The auricular wound requires careful hemostasis since bleeding will tend to hematoma and possible infection. The wound is closed with a continuous silk suture and a thin roll of cotton saturated in collodion is placed over it so as to fill the postauricular fold. The auditory meatus is then blocked with cotton and the concha filled with a wad of cotton soaked in collodion. When the collodion dries it will be seen that the auricle is securely compressed between the two hardened cotton plugs. This insures complete approximation of the anterior and posterior skin of the concha. Fibrous tissue later develops in this region which makes the loss of the cartilage scarcely noticeable. The auricular dressings are not disturbed until the eighth day. They are then soaked off with ether, the suture is removed and the post auricular incision again covered with collodion cotton for another week.

25 E. Washington St.

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DISCUSSION

Dr. Harry Pollock, Chicago: Dr. Salinger, in his inimitable manner, has presented the subject so thoroughly, so completely, so clearly, that every thing is clear in the minds of the listeners, and there is very little new to add. However, I was greatly pleased as well as honored when I was asked to open this discussion, because about ten years ago when I presented a similar subject—namely, ivory implants in plastic surgery, he vociferously condemned the use of ivory, stating that it was and always will be a foreign body in the tissues, being a heterogeneous material, and would very often slough out. I am surely delighted to learn that experience has changed his ideas. While we have employed tibia, costal cartilage, ear cartilage in plastic surgery, I still am of the opinion that there is still a restricted use for these materials, but in far the larger number of cases, ivory is the implant of choice for the reasons enumerated by Dr. Salinger. Using cartilage, you are always dealing with a double operation and thereby necessarily incurring a double chance of infection. Occasionally the infection of the source of the implant may be quite disagreeable and serious, as in one case where we found ourselves dealing with an osteomyelitis of the sternum following a costal cartilage resection. If perchance your ivory implant wound becomes infected, the ivory is easily removed and at a later time can be reinserted without again resorting to a double operation.

Concerning the sliding or changing position of the ivory implant, I believe that this can be obviated by the method which I introduced, namely, perforating with small holes so that the resulting connective tissue can grow through these perforations and form firm bonds to hold them in position.

Now regarding foreign body reaction—I am not so confident that a small percentage of failures is due to that cause. Rather credit low grade infection or pressure necrosis as the causative factor. I do not believe that intolerance to ivory will cause such quick reactions as redness of the overlying skin and a fistula formation; rather let us believe it is due to a low grade infection or pressure necrosis. I agree with Dr. Salinger that it is often very difficult to remove implants, because my experience has shown that they are surrounded by a thick firm fibrosed capsule, so that after the ivory is removed the capsule will often support the tissue just as if the ivory were in place.

Regarding the statement that ivory should never be used in the presence of ozena, I certainly cannot substantiate that remark, and would suggest to the author that if he would cure the ozena first, by implants of ivory submucously, he then would be in a position to employ ivory in a patient who had had ozena, and who was now free of the disease or at least free of all symptoms of ozena.

All other statements in his paper regarding size of implants, preparation of pockets and particularly asepsis, I heartily agree with, and if these factors are carried out our results will be good and we will have many grateful patients, praying for us rather than paying us.

Dr. Walter Stevenson, Quincy: I wish to commend Dr. Salinger on his excellent presentation and to compliment him on the high percentage of good results he has had. Dr. Salinger has covered every detail of this problem so thoroughly, and it is all so much in conformity with the results of my limited experience, that there is little left to say.

Regardless of the fact that ivory is everlastingly a foreign body, even more so than autogenous implants such as cartilage and bone, experience has shown that unless undue trauma is experienced, ivory implants do remain permanently and they certainly do fulfill all the requirements necessary as substances to fill defects.

I wish to emphasize what Dr. Salinger has said, particularly regarding the great importance of absolute asepsis, and also that meticulous care must be given to the preparation of the implant. To those who consider this work child's play, I will suggest that they endeavor to fashion a round piece of ivory from a block of the same material. The work is tedious and time consuming. Often the completed product must be thrown away and a new one made. I have found in my few cases, fourteen in number, that I feel more comfortable if I have made more than one size of the same-shaped implant for each case. I was disappointed in one of my cases by having the implant decay, with subsequent extrusion. This was because I used a poor grade of ivory. It was fashioned from an old billiard ball. My Scotch ancestry seemed to have inspired me with the thought that I could easily and cheaply obtain all the material I wanted by using ivory billiard balls which were no longer serviceable for playing purposes. The constant impact on this old ivory evidently did something to its molecular composition. I now use the best quality of ivory obtainable.

I have been well pleased with my results, and thank Dr. Salinger for his inspirational work.

Dr. O. E. Fink, Danville: I do not see how any of us who are occasional operators can add anything of any particular value. I heard Dr. Salinger talk before a group in Chicago at the time he reported his first series, and at that time the results were good and now he reports a larger series with improvement in the results, and it seems the fellow who is only an occasional operator should limit his material to ivory implants. I think the larger your experience the more you develop a technic and refinements that you do not have in your early cases, and for that reason we who do not operate so often—our results are not so good.

Dr. Blair's talk this morning was very impressive. Of course he has had a vast experience. My impression was that his preference was for cartilage. I was glad to hear Dr. Salinger say he was reluctant to use it in syphilis or ozena, because it seems to me these are the type that come more often than any others for repair and the results have not been encouraging in that type of case. I believe, with the large number of

automobile cases and neglected care of nose injuries, that the time will come when we will be asked more often to repair these cases with implants of cartilage, autogenous bone, or ivory. I think if we use ivory implants we can save some discomfort for our patients, because I have had patients complain more of the pain at the site from which the transplant was taken, than in the operative field. So I feel that it would be to the patient's benefit at least to use ivory. The essayist did not say anything about tuberculosis of the nose, or whether he would use it in a case of tuberculous destruction of bone.

I think this will give us stimulus to further work, and that it will be of aid in the future. I feel that this is a very good paper and timely, because we are going to have more occasion to do such surgery in the future than at present.

Dr. H. L. Ford, Champaign: I would like to express my appreciation for this excellent paper. I would like to ask if Dr. Salinger feels that we invariably get absorption of the septal cartilage when used following submucous resection to fill in a small depression on the dorsum; I personally do not think so. I would also like to have his idea as to the value of the Maliniak procedure, that is, cutting the two lateral cartilages and fitting them back to back. Ferris Smith uses skin grafts with epithelial surface denuded, as an implantation for small dorsal depressions.

Dr. Samuel Salinger, Chicago (closing): Dr. Lederer remarked to me while Dr. Pollock was giving his discussion that Pollock is like an elephant, he never forgets! This idea of drilling holes in ivory in the hope that fibrous tissue will grow through is all the bunk. I know it is. When I had occasion to pull out one of these ivory pieces, I found no evidence of such a process. I think holes are a disadvantage. They weaken the implant, and they constitute pockets in which blood might accumulate and become infected. Then the theory was held that the fibrous band would also help to fill out the depression and this too I believe to be a fallacy. When I have had to take out an implant for reasons stated in the paper, the nose went back to its former state. I found the greatest reaction to ivory takes place in the columella. I would not use an ivory implant in a patient with ozena. The skin is thin, there is atrophy of the subcutaneous tissues and the skin overlies it very closely, so that when you separate it from the bone the circulation seems to suffer. At any rate, I have had more trouble in these cases than in any other type.

Dr. Stevenson mentioned his old billiard ball. That stuff is absolutely no good. It has lost something. Besides, you can get fresh young ivory very cheaply. The Brunswick-Balke-Collender Company practically throw away the outside of the tusks and will sell you all you can use for a dollar or so. When you get it, be sure not to use the outer dark layers of the tusk; use the inner part which is pure white. We cut it up with an ordinary jig saw into blocks of approximate size needed for the implant. We then grind the block on a hard stone until it is properly shaped and finish it off with a dental carborundum disc. I find the "Handee Grinder" which costs about $10, a valuable tool for this purpose.

Naturally I would not use ivory in a patient with tuberculosis of the nose. I have used septal cartilage to fill in a small defect and have had it succeed, when I can make an entirely separate pocket that does not communicate in any way with the septal incision or with the pocket between the flaps. I make a small incision through the tip of the nose, elevate subcutaneously and pass the cartilage into the pocket thus prepared. On the other hand, some of the worst infections I have ever seen, have been following the use of costal cartilage. The Maliniak procedure is very good. Split skin grafts have also been used as well as fascia lata. I think they are both very valuable for small defects if you care to use them.

MYXEDEMA HEART

V. THOMAS AUSTIN, M. D.
URBANA, ILLINOIS

The syndrome of "Myxedema Heart" was first described by Zondek in 1918.[1] He observed an enlargement of the heart, a sluggish heart action, and a uniform flattening or inversion of all the T waves of the electro-cardiogram. He and later Fahr[2] (1925) in this country reported an associated congestive failure which, though failing to respond to digitalis, was readily responsive to thyroid medication. They further observed an improvement in heart action, a decrease in the size of the heart and a reversion of the electrocardiogram to normal.

Since that time there has been an active interest in this rather unusual form of heart disease. Several noteworthy clinical studies have been made,[3-8] from which one might conclude that cardiac dilatation with the electrocardiographic changes are fairly constant findings in severe myxedema. On the other hand frank congestive failure has been observed much less commonly, and its relative frequency has been the basis for considerable controversy. A possible explanation for at least part of this difference of opinion would seem to lie in the varied interpretation of those signs which might be attributed to either early congestive failure or myxedema per se,—that is slight dypsnea and edema of the ankles.

However, in the majority of cases of myxedema heart, congestive failure, if present, is mild. A reasonable explanation for this lies in the fact that the low level of activity in myxedema pre-

Division of Medicine, Carle Hospital Clinic.

Paper presented at the meeting of the Illinois State Medical Society, Peoria, Illinois, May 19, 1937.

vents the cardiac dilatation and weakness from making themselves more evident.

There is need for further study of the pathology in this condition. The enlargement of the heart is due principally to dilatation, though myxedematous infiltration of the heart muscle may account for some increase in bulk, and pericardial effusion has been known to increase the area of percussion dullness and the size of the roentegen shadow of the heart in myxedema.[9, 10] Coronary sclerosis occurs frequently and is no doubt responsible for some cases of heart failure.

Fig. 1. Photographs of the patient before and after administration of thyroid substance.

Generalized arteriosclerosis is likewise common, and Higgins[11] has called attention to the invariable hypercholesteremia as of etiologic significance. A similar disturbance in cholesterol metabolism is observed in diabetes mellitus, and here also arteriosclerosis is common.

The treatment of myxedema heart consists simply in the administration of thyroid substance, digitalis being quite ineffective. However, caution must be exercised in the elevation of the metabolism as the increased blood flow through narrowed coronary arteries may precipitate attacks of angina pectoris; and death has been known to occur.

The following case presents some unusual features of myxedema heart.

Case Report. The patient, a white female, aged 59 years, was first seen on a house visit October 11, 1936. A history was obtained of sudden onset of vertigo, faintness and weakness of a rather severe degree. The immediate picture was one of shock with marked pallor, cold moist extremities, shallow rapid respirations, a pulse rate of 170 per minute and a blood pressure of 90 systolic and 40 diastolic. Caffein sodium benzoate was administered hypodermically. Within a short time the tachycardia gave way to an auricular fibrillation with a precordial rate of 115 per minute. The extremities gradually became warm and dry and the color improved. The patient was seen again five hours later at which time she was resting comfortably but the heart was still fibrillating. The following morning the patient seemed quite recovered from her acute embarrassment and the pulse was regular with a rate of 60 beats per minute. She was advised to come in for further investigation.

She was again seen on October 15. The family history was irrelevant. There was no history of rheumatic fever, chorea or tonsillitis. The menopause had been uneventful at forty-seven years of age. Over a period of several years there had been a gradual development of cold intolerance, sallow color and dry scaly skin. The weight had remained constant at approximately 111 pounds.

During the past four years the patient had experienced three episodes comparable to, but less severe than that observed on the first visit. Each attack had lasted less than twenty-four hours during which time she had had medical attention and diagnoses of heart attacks. There was no interval history of congestive failure except for very slight dyspnea an exertion. There had been, however, a gradual development of increasing exhaustibility although the patient continued to take care of her house work. Physical examination at this time revealed a rather poorly nourished white female with an apparent age of sixty-five years. The skin was sallow, thick, dry and scaly, particularly on the dorsal aspects of the forearms. There was a definite puffiness about the eyes and a rather dull expression. She was mentally alert. The blood pressure

showed a systolic of 110 and diastolic of 60 mm. of mercury. The pulse rate was 56 per minute. The lungs were clear. The heart was definitely enlarged. The heart tones were rather distant and regular. No murmurs were audible. The liver edge was at the costal margin. There was no dependent edema. The ankle jerks had the typical myxedema character. There was a ptosis grade I of the right upper lid. The fundus examination was essentially negative.

The urinalysis was entirely negative. The hemoglobin measured 80%. The erythrocytes numbered 4,000,000 and the leucocytes 6,700 per cu. mm. The differential count showed 35.5% lymphocytes, 4.5% monocytes, 53.5% neutrophiles, 1.5% eosinophiles and 1% basophiles. The serologic test for syphilis was negative. The blood urea measured 48 mg. %. The phenolsulphonephthalein kidney function test showed a total excretion of 70% in one hour. The basal metabolic rate was minus 28%. The teleoroentgenogram showed a transverse diameter of the heart of 18.5 cm. with an internal diameter of the thorax of 28 cm. The electrocardiogram showed a rate of 46 per minute with extremely low voltage and isoelectric T waves in all leads (see Fig. 3).

On October 20 the patient was started on 1 grain of desiccated thyroid daily. On October 23 the dose was increased to 2 grains daily. The patient experienced no intolerance to the thyroid substance and on October 26 the dose was increased to 2.5 grains daily. There was a gradual and definite response clinically to specific therapy. The pulse rate increased to 76 and the blood pressure to 138 systolic and 72 diastolic in one month. During this time the weight was reduced to 99.5 pounds. The patient observed increased warmth of her skin which became soft and of normal texture. She experienced an increased vitality and endurance. There have been no recurrences of the auricular fibrillation, and under treatment she has developed no angina pectoris or other signs of coronary disease. The accompanying photographs, taken shortly after the onset of treatment and two months later, show clearly the change in facial expression resulting from thyroid medication. (See Fig. 1.)

Interval basal metabolic rates, electrocardiograms and teleoroentgenograms were observed over a period of eighteen weeks. A continued reduction in the size of the heart and reversion of the electrocardiogram to normal extended over this entire period. These factors are recorded in Fig. 4.

Discussion. It is unfortunate that an electrocardiogram was not available at the time of the first visit; but the episode of absolute irregularity of the heart and vascular collapse warrants a clinical diagnosis of paroxysmal auricular fibrillation. Its relationship to the myxedema heart is interesting. There have been no recurrences under treatment, and thyroid medication has failed to demonstrate any significant coronary disease which might be held responsible. It is suggested as a complication of myxedema heart, though the possibility of its being a coincidental finding is recognized. So far as I know, only three cases of auricular fibrillation occurring in myxedema heart have been previously reported. Walker's[12] case had a persistent auricular fibrillation known to exist eleven years before the diagnosis of myxedema heart, and thyroid medi-

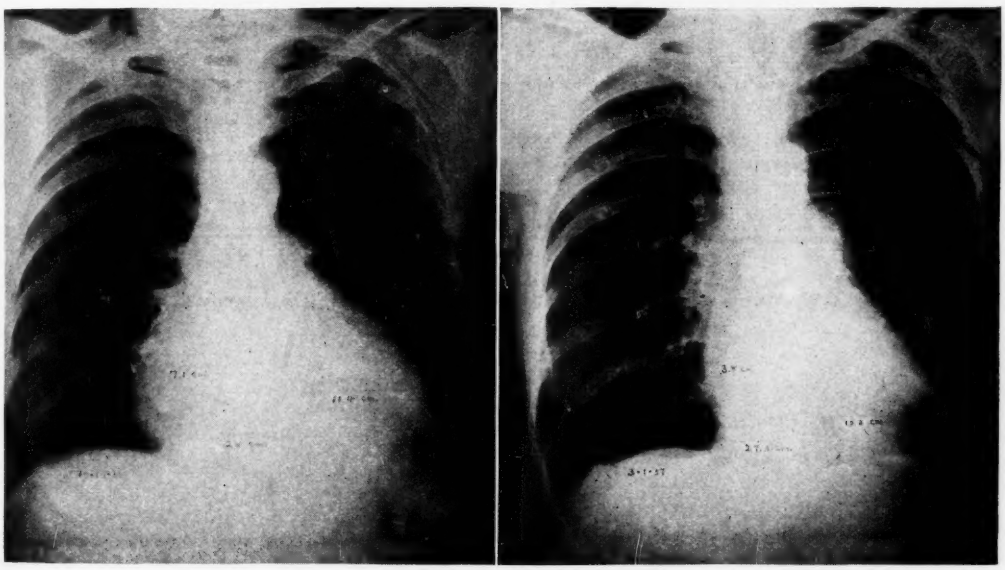

Fig. 2. Teleroentgenograms before and 18 weeks after onset of thyroid medication showing 4.5 cm. reduction in transverse diameter of heart.

cation had no effect on the irregularity. A second case was given in a series reported by Ohler and Abrahamson,[3] and various abnormalities of rhythm persisted on thyroid treatment. The third case was reported by Grant[18] in which thyroid therapy corrected the auricular fibrillation, but the persistence of an intraventricular block suggested the co-existence of coronary sclerosis.

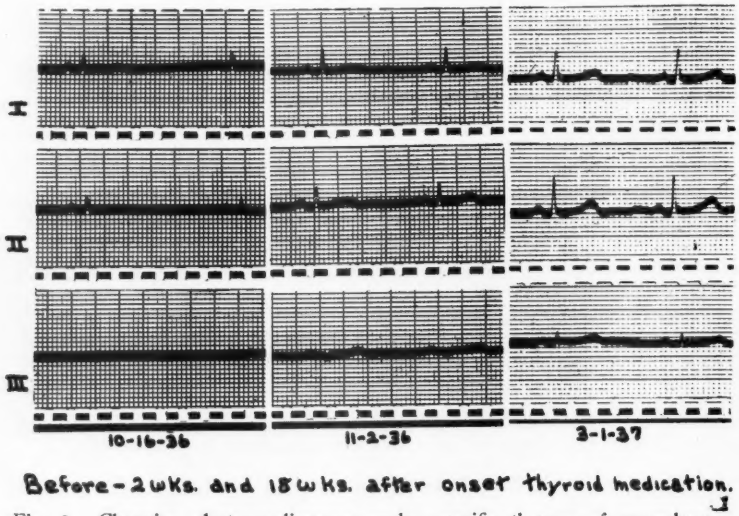

Fig. 3. Changing electrocardiograms under specific therapy of myxedema.

CONCLUSION

1. A case is presented showing typical changes of myxedema heart and a return to normal under thyroid medication.

2. Congestive failure was not an evident complication.

3. Auricular fibrillation as a complication of myxedema heart is suggested by this case, though, as in previously reported cases, it is not possible to exclude the existence of an associated coronary sclerosis as a factor in its production.

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DISCUSSION

Dr. Frank Deneen, Bloomington: This case is unusual especially because of the increased pulse pressure that he had before thyroid medication. Hyperthyroidism is frequently spoken of as being a condition of fatigue. I think the fatigue is an end-result of hypertonicity. When the patient gets up in the morning he is not fatigued but after he is up and around with increased metabolism the tiredness increases. In myxedema of this type, which is so frequently spoken of as being a state of fatigue I think the heart is atonic and under thyroid treatment, when there is more activity on the part of the heart muscle with increased pulse pressure, these patients do not tire. They are purely cases of an atonic state. After thyroid medication these patients perform both increased physical and mental work without development of any fatigue whatever.

I think there is one thing that should be spoken of and that is the low basal metabolic rate. A low metabolic rate in itself should not be considered hypothyroidism. There is a large group of patients who normally run a low rate. Just the same, we have a large number of toxic thyroids with low basal rates, giving

them thyroid on the basal metabolic rate alone is very dangerous.

I think it is very interesting to follow these cases of cardiac sluggishness with or without myxedema and find the wonderful improvement they make, and how many of them apparently develop a normal restoration of thyroid function, at least partially, so that in a short space of time they get along with less and less thyroid and sometimes get along without any at all.

The changes in the electrocardiogram are interesting and those of us who have followed them are amazed at the changes that take place.

I want to say that Dr. Austin has presented the case very well. It should be instructive for all of us from the standpoint of studying not only the lack of thyroid but increased thyroid secretion and its function.

Dr. Willard O. Thompson, Chicago: There are two entirely different types of response of the heart to thyroid treatment in patients with myxedema, which I can illustrate very well by describing two patients recently seen in the County Hospital. One entered with decompensation, cyanosis and a large heart. Although she appeared typically myxedematous her basal metabolic rate was only 20% below normal. With digitalis the decompensation did not disappear but when a large dose of thyroid was given, which ordinarily causes a considerable amount of strain on the heart, it did clear up. The other patient presented a different picture. She was typically myxedematous with a basal metabolis rate 40% below normal. A single dose of thyroid containing 1.63 mgm. of iodine was given and the response was characteristic and without any ill effect. Her myxedema cleared up in typical fashion and no cardiac embarrassment resulted. After the effect of this dose had disappeared, her metabolism was again raised toward the normal, this time with a larger total dose of thyroid given in equal portions every day. After she had had ten doses, a total of 5 mgm. of iodine, the patient developed severe precordial pain with fewer and leukocytosis and suffered from a characteristic attack of coronary thrombosis. Thyroid was stopped immediately and the patient had a rather severe time of it for a long period. Her cardiac embarrassment cleared up very slowly as she gradually became myxedematous again, and we then tried to give her more thyroid in small doses but her heart was unable to stand the increased work placed upon it. We were thus faced with a dilemma. The heart, because of its myxedematous condition, was inefficient and yet, because of the damage resulting from coronary thrombosis, was unable to meet the increased demands placed upon it by the very thing necessary to change it.

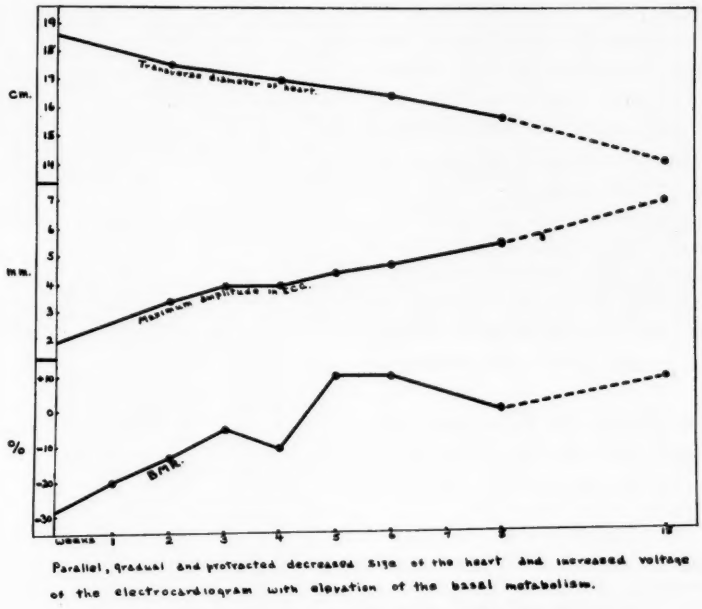
Cm.
Transverse diameter of heart.
mm.
Maximum amplitude in E.C.G.
%
B.M.R.
Weeks
Parallel, gradual and protracted decrease in size of the heart and increased voltage of the electrocardiogram with elevation of the basal metabolism.

Fig. 4. Interval findings of myxedema heart under treatment.

Dr. V. Thomas Austin, Urbana: Apropos of the discussion: There is one thing we should all remember: myxedema is a clinical and not a laboratory diagnosis. It is possible to have a low metabolic rate without myxedema and conversely myxedema is sometimes observed with rates not greatly lowered. Myxedema should be considered in the differential diagnosis of all markedly enlarged hearts. There is no heart condition in which response to therapy is more gratifying. In closing, caution should be exercised in every case under treatment because of the fact that coronary sclerosis is a common complication and occlusion is prone to occur.

GROWTH DEFORMITIES RESULTING FROM OSTEOMYELITIS

JOHN A. SIEGLING, M. D.

URBANA, ILLINOIS

It was formerly thought that the occurrence of deformity in osteomyelitis due to involvement of the epiphyseal cartilage was relatively infrequent. Recently there have been several reports[1, 2] showing a high incidence of partial or complete arrestment of longitudinal growth of long bones. It was decided to review the cases of osteomyelitis seen at the University of Chicago Clinics to determine the incidence of growth arrest here.

To understand properly the production of osteomyelitic growth deformity, it is perhaps wise to review briefly the physiology of bone growth. Stephen Hales[6] and later John Hunter[7] demonstrated experimentally and Ollier[8] clinically, that bones grow at their ends and that there is no interstitial growth. Other investigators[3, 4, 5] have subsequently confirmed this work with additions. Haas[9] demonstrated experimentally that the most important elements for longitudinal growth were located in the columns of cartilage cells in the epiphyseal plate, and that destruction of these cells resulted in growth arrest with asymmetry and shortening.

Of the cases reviewed at this Clinic, some were acute, some chronic, and some presented old deformity. The findings are recorded in the accompanying table.

TABLE I

Total cases of osteomyelitis reviewed	423
Total cases in children	277
Total cases in children with long bone involvement	241
Total number of patients having overgrowth (4.9%)	12
Total number of patients with growth arrest (31.5%)	76
Total long bone lesions in the 241 children	419
Total bones having growth arrest (24.5%)	103
Total bones having overgrowth	13

It will be noted that the incidence of interference with growth is rather high. In some of the cases the possibility of subsequent deformity had apparently not been suggested and in others no attempt had been made to minimize deformity before the patients were seen at this Clinic. It would seem that more emphasis on this subject of arrest would be justified in text-books, many of which scarcely mention it.

The growth deformities of greatest significance were either shortening of an extremity due to complete arrest of growth, or deformity resulting from arrest of one part of an epiphysis with continuation of growth of the remainder. Another interesting irregularity was overgrowth of an osteomyelitic extremity due to stimulation of growth by the infection. As will be noted in Table I, twelve patients had longitudinal overgrowth of a bone. In no instance was this sufficient to make a raised shoe necessary and no case showed unequal overgrowth of only part of a

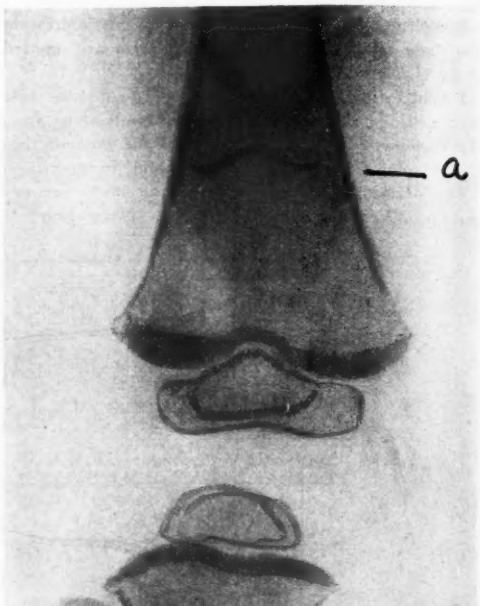

Fig. 1. Knee joint of a child illustrating transverse lines (a) resulting from administration of phosphorized cod liver oil. The distance from these lines to the epiphyseal lines progressively increases as new bone is added at the metaphyses. Note that the distal end of the femur grows faster than the proximal end of the tibia.

From the Division of Orthopedic Surgery, The Department of Surgery, The University of Chicago.

Presented at the 87th Annual Meeting of the Illinois State Medical Society, Section on Surgery, Peoria, May 18, 1937.

bone. Thus overgrowth is interesting but not of very great importance as a truly deforming factor.

Seventy-nine of the one hundred and three growth arresting lesions were septic hips with

Irregularity of epiphyseal line and deviation from the perpendicular when compared with the normal corresponding epiphysis are presumptive evidence of arrest.

Very often an x-ray taken sometime after a

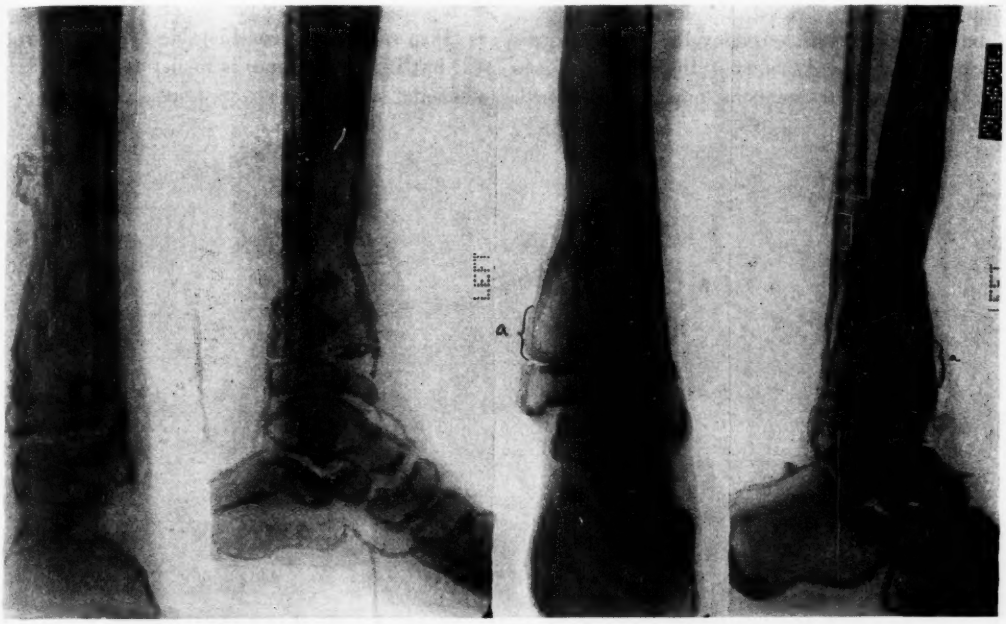

Fig. 2a. Osteomyelitis inolving the distal end of the tibia. Note that the infection has crossed the epiphyseal line and destroyed a portion of the epiphysis itself.

Fig. 2b, c. Same as 2a one year and seven months later. Note that the epiphyseal line is open and perpendicular to the axis of the shaft. About ¾ of an inch of new bone (a) has been added and the healed focus has become more distant from the epiphyseal line, indicating that growth arrest has not occurred.

osteomyelitis involving the capital epiphysis. This contributes materially to the high percentage of growth arresting lesions. Growth arrest in these cases was almost invariable, though a few escaped by fusion of the capital epiphysis alone to the acetabulum with continuation of growth at the epiphyseal cartilage.

In any case of osteomyelitis which threatens the growth disc it is of extreme importance to point out to the parents the possibility of deformity and to have adequate follow-up x-ray and clinical examinations. Where one is suspicious of growth arrest, it is always best to compare the suspected epiphysis with its mate and to look for evidence of closure of the epiphyseal cartilage line on the roentgenogram. The configuration of the line should be observed closely and any deviation from its normal position perpendicular to the diaphysis should be noted.

surgical procedure on a child with osteomyelitis demonstrates a linear shadow at a variable distance from the epiphyseal line. Similarly, administration of phosphorized cod liver oil at the time of hospitalization for osteomyelitis results in a radio-opaque line. (Fig. 1.) These lines are clinically significant for by measuring their distances from the epiphyseal lines, we are able not only to determine whether or not growth is taking place, but whether it is occurring equally from all sides of the epiphyseal plate. In some instances of partial arrest the distance is observed to increase on one side while on the other side the growth arrest or phosphorus line angles down to the epiphyseal line, indicating that arrest of longitudinal growth has occurred on that side.

The majority of osteomyelitic lesions occurring in children seem to be on the diaphyseal side

of the epiphyseal cartilage. This is attributed to the fact that the blood supply at this site consists of terminal arteries in which infective emboli lodge and multiply.

In many cases in this series the epiphyseal cartilage plate seemed to act as a limiting body, and as infection cleared, the lesion grew away from the epiphysis. In several instances, although infection penetrated the cartilage into the epiphysis, arrestment of longitudinal growth did not occur. (Fig. 2.) This is a surprising fact and one that serves to complicate the prognosis.

When growth arrest does occur the ultimate deformity depends upon the age at which the arrest occurred and the rapidity of growth of the particular epiphysis involved. Arrest of the proximal humeral epiphysis is relatively unimportant except in consideration of cosmesis, and there can be considerable inequality of humeral length without conspicuous deformity or loss of function. On the other hand, arrest of the distal ulnar or radial epiphysis may produce not only deformity in the way of ulnar or radial deviation, but also loss of function. Similarly, arrest of the distal tibial or fibular epiphysis may produce inversion or eversion of the foot. (Fig. 3.) Compensation for inequality of femoral length is taken care of to a considerable extent by pelvic tilt but if the difference is moderate, limp is evident and static changes occur in consequence.

Fig. 3. a. Old varus deformity of ankle due to partial arrest of tibial epiphysis during childhood. Extremity is 1 inch short. Note angulation of weight bearing surface of joint. b. Postoperative appearance one year and two months after ostectomy. The deformity is corrected and joint mechanics improved.

Early recognition of growth arrest is of great importance. Where progressive inequality of leg length is occurring, surgical arrest[10] of growth of the corresponding epiphysis on the other extremity will prevent further discrepancy. Where shortening is considerable, surgical fusion of several of the epiphyses of the normal extremity at the proper time will allow equalization of leg length by the end of the growth period. By utilizing this procedure, we are able to prevent inequality of length which might later require the

more formidable procedure of leg lengthening or shortening.

It is particularly desirable to stress that the integrity of the epiphysis is vital to normal longitudinal growth. In the surgical approach to an osteomyelitic focus at or near the epiphyseal plate one should use every caution not to strip periosteum from the cartilage. The ostectomy should be started at a safe distance from the epiphysis and directed toward the lesion. (Fig. 4.) Curettage in the depths of the focus should be avoided. Speed[11] has suggested simply wiping out the granulations and we have found this method very satisfactory.

Fig. 4. a. Osteomyelitic focus in metaphysis. b. Surgical approach avoiding epiphyseal line. c. Same knee 1 yr. and 7 mo. later. Note growth lines a and b indicating that longitudinal growth has been uninterrupted.

CONCLUSIONS

1. It is apparent from this series of cases of osteomyelitis that lesions involving the growth cartilage in long bones can and do cause varying degrees of arrest of longitudinal growth.

2. Whether or not any individual lesion will cause arrest and deformity is not always predictable.

3. The possibility of growth arrest in such lesions should be kept in mind and explained to the parents.

4. Surgical approach to the epiphyses should be made with extreme caution.

5. Repeated clinical and roentgenographic examinations should be made, so that methods can be instituted at the proper time to prevent progressive deformity.

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THE DIAGNOSIS OF BRONCHOGENIC CARCINOMA: ROENTGEN ASPECTS

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Bronchogenic carcinomas occur with sufficient frequency to warrant the rather extensive reference to them in the literature within recent years. Roentgenologic and bronchoscopic examinations play a major role in their detection. Usually when cases come under observation, the pathological changes are sufficiently advanced to give roentgen findings; these may be suggestive but frequently they are not conclusive and other data are essential to definitely establish the diagnosis. Although numerous cases of undoubted bronchogenic carcinoma other than these which served as the basis for this paper have been seen by us, we have limited our discussion to proved cases. Our object is to correlate the roentgenologic with the pathologic changes with a view towards ascertaining how much reliance can be placed upon the purely objective findings noted in arriving at a diagnosis.

The incidence of bronchogenic carcinoma has risen sharply in the past century. Stokes[1] sounded the warning in 1837, stating that his experience in lung tumors was by no means as rare in England and Ireland as was generally assumed. Boyd,[2] about the same time, went so far as to say that primary lung cancer was more common than secondary. Adler,[3] in 1912, thought Boyd was exaggerating, believing that "while lung cancers were no longer rare, they still belong to the class of rarer neoplasms." Nevertheless, whereas Passler[4] found only 74 cases of undoubted primary cancer of the lung in 1896, Adler considered the evidence of malignancy indisputable in 374 cases up to 1912. The recent large series reported from individual institutions[5, 6, 7] indicate the increased number now being diagnosed. Bronchogenic carcinomas now constitute 6 to 8% of all carcinomas, being second only to gastrointestinal malignancies in frequency.[8] Part of the recent increase in incidence is undoubtedly due to the more frequent use of the roentgen ray and bronchoscope. That many lung carcinomas were previously misdiagnosed is well illustrated by the Joachimstal incident. Repeated inquiries as to the incidence of lung cancer amongst the miners of that town elicited negative answers. However, when two lung cancer minded physicians did 13 post mortem examinations within one year, 1929-30, they found nine cases. The fact that more individuals at present live to an age when a cancer is especially apt to develop is probably another reason for the increased incidence.

Carcinoma of the lung is primarily a disease of later life. Although Beasley[10] recorded a case in an infant of 16 months and many persons attain the age of 70 years or more before developing the malady, most of the cases occur between the ages of 40 and 60. Thus far, definite etiological factors have not been demonstrated. Heredity, so far as is known, plays little or no role. Bela,[11] in 1910, thought influences of occupation or trade might be contributing factors. The disproportionate incidence of cancers in miners of certain ores, chimney sweeps and aniline and paraffin workers tends to indicate the truth of this assumption. Recently, Rosedale and McKay[12] noted that 75.4% of their patients were employed in occupations requiring exposure to dust or other irritating atmospheric factors. They thought the chronic bronchial irritation might lead to protoplasia and metaplasia. Arkin and Wagner[8] obtained a history of addiction to smoking in 90% of their cases and believed that this might constitute an irritation factor. The role of chronic bronchial infections, influenza and pneumonia, is uncertain. It has been shown[13, 14] that a metaplasia of the basal layers of the epithelium occurs in influenza and Ewing[15] calls attention to the change of alveolar epithelium to a cuboidal form which has been described in atelectatic foci. While the dictum of Rokitansky that tuberculosis and carcinoma were incompatible has been definitely disproven, the evidence does not support those who, like

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Ewing, place tuberculosis foremost as an etiologic factor. Recent reports show tuberculosis in only an incidental percentage of cases. Fried[16] believes the role of tar, especially in road pavements, is eliminated by the concurrent increase noted in Russia, where the tar factor is not present. Automobile fumes as a causative agent can be eliminated on the same grounds.

Histologically, Geschickter and Denison[17] divided their cases into two rough groups—the squamous cell type and the adenocarcinoma. On embryological and histological considerations, they considered the lung root regions and the terminal ramifications of the peripheral bronchioles as the most likely sites for metaplastic changes. They believed that squamous cell lesions were more apt to occur at the hilum and adenocarcinomas at the periphery, and they were able to fit most of their material into that scheme. Some of their cases, however, had equally prominent epidermoid features and adenomatous arrangement and could not be definitely classified into either group. Other writers[12] were unable to make their material fit into this simple classification. Arkin and Wagner[8] believe most bronchogenic carcinomas originate from the less differentiated multipotential cells of the basal layer, these giving rise to the squamous cell and the undifferentiated round or spindle cell lesions, while the epithelium of the mucus secreting glands of the bronchi give rise to the adenocarcinomas. This enormous plasticity of the epithelium has led to various opinions as to type and origin of tumors. Rosedale and MacKay[12] found round or spindle cells in all their cases and considered them the primal or parent cells of the bronchial epithelium. Geschickter and Denison[17] record a case where the primary lesion was adenocuboidal while the bone metastases were squamous cell in type.

Sante[18] states that carcinomas originating from the bronchi appear only in the hilar lesions. They may show 1. a diffuse growth from a focus on the superficial epithelium of a bronchus or 2. a nodular growth when the lesion originates from the mucous gland epithelium of the deeper epithelial layers. Both types of hilar carcinoma are prone to induce secondary pathology early. They both tend to occlude the bronchus, predisposing to infection and abscess or causing atelectasis, or both. In addition, the nodular type tends to early central degeneration and excavation. According to the same author,[18] the peripheral type is described as a primary alveolar carcinoma, an opinion which is strongly attacked by many.[8, 16, 17] Whether the alveoli are lined with epithelium, as claimed by MacCallum and Ewing,[15] or with mesothelium, as claimed by Fried[16] and accepted by Geschickter,[17] thus shifting the origin of the peripheral tumor from the alveoli to the terminal bronchiole, it is generally recognized that the peripheral carcinoma develops into either a single diffuse or a multiple nodular lesion.

The single diffuse type starts as a small patch of consolidation in the parenchyma and spreads with a feathery infiltrating border. Progressing by way of the lymphatics and bronchi to involve an entire lobe or lung, it pays scant regard to interlobar septa or other natural barriers. Until complete consolidation of the entire lung occurs, there is no indication of mediastinal displacement or of enlargement of the chest cavity. Further growth initiates pressure effects but atelectasis is rarely seen. There may or may not be central necrosis.

The multiple nodular type begins as many poorly defined nodules in one or both lungs. These are usually small at first, grow in size and may coalesce to form large irregular masses. They exhibit a more marked tendency to break down than do the diffuse types and are more prone to metastasize. Some workers have had difficulty in differentiating this form grossly at the autopsy table and at times the malignancy was not very obvious in the microscopic picture despite the presence of grossly and histologically characteristic metastases. This type of lesion, frequently referred to as miliary or multiple primary lung malignancy, seems so improbable of occurrence on the basis of what is known of malignancies in other organs, that one cannot help but wonder whether it is not a metastatic carcinosis arising from a very small primary site, a not uncommon occurrence elsewhere in the body.

Metastasis is common in bronchogenic carcinoma, the peripherally located lesions apparently being more apt to spread. Distribution of the metastases may occur 1. by way of the bronchi producing a bronchopneumonic configuration; 2. by way of the lymphatics to the lymph nodes,

giving the orthodox localized masses, especially near the hilus, or causing a carcinomatous lymphangitis which gives a rather characteristic roentgenological and histological appearance; and 3. by way of the blood stream. Although only a relatively small number of sites of metastases are recognized ante-mortem, a rather diffuse generalization is found during a careful post mortem examination.[12] The drainage of the venous return of the lung into the left side of the heart, from whence it passes into the major circulation, may play a role in this spread. Common sites of metastases are the osseous system, brain and adrenals.

The duration of bronchogenic carcinoma is extremely variable. Graham[19] observed a case for seven years after the diagnosis was made and somewhat shorter survivals are listed by several authors. The average duration of life after diagnosis is rarely over 12 months, however, and the first symptom may be a fatal hemorrhage.

The symptoms and findings in bronchogenic carcinoma depend to a considerable degree upon the type of tumor, its location, and the presence or absence of metastases or associated pathology. They may be those of pulmonary disease or be centered elsewhere because of metastases. When the latter condition applies, the findings are characteristic of tumorous involvement of the organ affected, and the prognosis in these cases is practically hopeless. Cases presenting themselves with chiefly respiratory manifestations require particular diagnostic study because they may offer therapeutic possibilities. No particular symptom or group of symptoms can be called characteristic of bronchogenic carcinoma. Cough, with or without sputum, is the most common early symptom. Clerf[20] calls attention to the significance of an insidious cough associated with an expiratory wheeze, best heard during and at the end of expiration. The cough is persistent and progressive. The sputum, at first scanty and muco-purulent, often becomes copious and frankly purulent with the advent of infection. Occasional blood streaking is common early but frank hemorrhage is unusual and occurs late. Dyspnea is slight at first and increases as the disease progresses. Pain is usually associated with infection distal to the obstruction in the hilar lesions. However, pain and often local tenderness are relatively early symptoms in the peripheral lesions, although then they usually denote extension to the ribs and pleura. As the carcinoma progresses, there may be loss of weight, dysphagia, hoarseness, pupillary changes and engorgement of the veins of the head and neck, depending on the areas involved.

The absolute diagnosis of bronchogenic carcinoma on the basis of the roentgenogram is difficult or impossible. The probable diagnosis of such a condition, however, can be made in a large percentage of these cases if the condition is kept in mind. It has been estimated that 20 years ago only 5% of such cases were diagnosed in vivo; at present approximately 50% are so diagnosed correctly; perhaps 90% should be possible of differentiation if all the available data and procedures are utilized.

Occasionally the lesion may be entirely intraluminal. In that instance, the film may be entirely negative, as in Kramer and Som's case.[21] In these cases bronchoscopy is of prime importance in the diagnosis. The intraluminal bulk of the tumor may cause bronchial occulusion with atelectasis, as in one of our cases. Usually, the carcinoma directly manifests itself as an increased density on the film. When the lesion presents itself in this fashion, it may assume a variety of appearances, depending on the type of lesion, its location, the stage of progression and the presence or absence of secondary pathology. The early hilar lesions appear as areas of marked density, with either sharply circumscribed or infiltrating borders. The localized type, usually adenocarcinoma, grows until it produces occlusion due to pressure. In this type, the entire lobe is apt to become atelectatic, giving a typical lobar density. Usually the tumor mass can be distinguished near the hilum, differentiating the condition from ordinary pneumonia. In the infiltrating type, usually a squamous cell lesion, there is more apt to be partial bronchial occlusion with infection distally. The presence of infection ushers in marked pneumonic densities, often with cavity formation, so that it may be difficult to exclude simple abscess. The localized lesions also tend to undergo central necrosis, simulating abscess cavities, and many of these patients have thoracotomies before the true nature of the pathology is suspected.

The peripheral lesion may present as single or multiple localized densities or as diffuse infil-

trating areas. The single localized areas are usually rather large when first seen, although involvement of the pleura with exudate formation or invasion of the ribs with destruction, producing pain, may bring the patient in when the primary lesion is quite small. The multiple localized lesions can hardly be distinguished from metastatic lesions ante mortem. The peripheral diffuse type of lesion appears as an area of density which often simulates pneumonia. Its lack of regard for the interlobar boundaries, however, should soon put it under suspicion, as should also the atypical clinical course.

Many cases of bronchogenic carcinoma present themselves when the findings are to a marked degree obscured by atelectasis or pleural exudate, or both. In these cases, the withdrawal of the fluid or induction of a pneumothorax is of extreme value in reaching a diagnosis. The intratracheal installation of iodized oil may also give valuable information, when bronchial obstruction is suspected or suggested by atelactasis or tumor formation. Occasionally a film made with the Potter-Bucky diaphragm will enable one to penetrate through an atelectasis and visualize the underlying tumor. Artificial pneumothorax will enable one to differentiate a parenchymal from a pleural or thoracic tumor. This procedure is of particular value in indicating to the thoracic surgeon the presence or extent of adhesions, findings of considerable prognostic value when surgical extirpation is considered. The extremely valuable role of bronchoscopy is omitted intentionally, since it will be covered by Dr. Paul Holinger in the next paper.

Accurate diagnosis is important for various reasons. It may prevent useless or even harmful therapeutic procedures based upon a mistaken diagnosis of a relatively benign condition. It has a direct bearing on prognosis and will determine in large measure the indications for treatment. Curative therapy admittedly is rather hopeless at the present time. Favorable results have been reported by bronchoscopic removal, fulguration and irradiation, but the number of five-year cures reported are comparatively few. Lobectomy and pneumonectomy seem to offer new therapeutic possibilities but, if these are to be realized, diagnosis will have to be made earlier than is usually done at present when most cases have already developed metastases.

In the differential diagnosis of bronchogenic carcinoma from the roentgen standpoint one must consider all other conditions which are capable of producing localized densities, atelectasis, or which predispose to fluid accumulations. The history is of the utmost value, since some of the conditions simulated on the film can be ruled out on that basis alone. Thus benign lung tumors can be recognized by their slow progress and paucity of symptoms. Occasionally neurofibroma or a pleural tumor may cause confusion. Both can be differentiated by the injection of air into the pleural cavity. Rib tumors and those arising from the thoracic wall can also be distinguished by the same procedure. Simple lung abscess usually has an acute onset with no preliminary symptoms but occasionally differentiation may be impossible without bronchoscopy, iodized oil injection, or even thoracotomy. Hilar enlargements due to Hodgkin's disease, lymphatic leukemia or lymphosarcoma may be observed to disappear with moderate doses of roentgen rays if other procedures have failed to make the diagnosis. Metastatic malignancy, showing the typical multiple rounded nodules, is usually rather characteristic and the primary lesion is ordinarily demonstrable. The ordinary aneurysm, with its frankly pulsating borders and tendency to erode rather than to invade bone, rarely causes much difficulty. The thrombotic solid aneurysm may be hard to diagnose, although the positive Wassermann and the very slow progression of the condition are indicative of a leutic lesion. Occasionally chronic fibroid phthisis may be diagnosed when the lesion is actually carcinomatous, or vice versa. The finding of tubercle bacilli and a long standing history is indicative of tuberculosis but the two diseases may be coincident. The atypical progress of the case or a positive bronchoscopic biopsy may be the only means of differentiation. Bronchiectasis, especially the localized unilateral type, perhaps following a sub-clinical pneumonia, may be exceedingly difficult to diagnose on the basis of history or roentgen findings. Bronchoscopy and iodized oil injection showing a patent bronchial lumen and dilatation of the bronchi are of great diagnostic value. Rigler[22] calls attention to the danger of the false positive diagnosis of bronchogenic carcinoma, citing the case of a woman to whom operation was recommended.

The patient refused and returned later for re-examination, at which time the lesion had entirely disappeared.

There have been 60 cases of bronchogenic carcinoma that have had both roentgen chest studies and a positive diagnosis by microscopy at the University of Illinois Research and Educational Hospitals during the past ten years. As previously stated, a few others were so diagnosed at necropsy but did not have chest films and many others were so diagnosed on the basis of history, clinical findings and the roentgenogram but were not included because of lack of microscopic proof. Of these 60 cases, 28 were diagnosed by section of tissue obtained through the bronchoscope, from metastatic glands, by means of the aspirating needle or from material coughed up by the patient; 32 of the cases came to autopsy. The roentgenograms of all cases were studied and the findings listed as to location, gross appearance of the primary lesion when unobscured, and the type of secondary pathology, when sufficiently prominent to be confusing. 27 of the lesions were central or hilar; 19 were peripheral or parenchymal; in 14 of the cases, the primary lesion could not be definitely identified objectively, although most of them then were possible of correct placement by inference. Of the visible primary lesions, 25 were described as infiltrating and 21 were nodular. It was found that this distinction was at times rather arbitrary, a beginning atelectasis secondary to a nodular lesion often giving the appearance of strand-like infiltrations, while a small area of atelectatic lung produced by an infiltrating tumor could be easily interpreted as a nodular mass. The presence of secondary pathology, such as infection, usually added immeasurably to the difficulty of visualizing and classifying the primary lesion. One of the cases showed a density corresponding to the right middle lobe and the findings were considered as consistent with a lobar pneumonia. At post mortem, a diffusely infiltrating peripheral carcinoma was found. Of the 14 cases where the primary lesion was entirely obscured by the secondary pathology, there was a massive pleural exudate in 2 cases; 9 cases showed an atelectasis of a single lobe of the lung; in 2 cases there was atelectasis of the entire lung on the side of the lesion. One case had both massive atelectasis and a considerable pleural exudate. A review was made of the diagnoses made at the time of the first examination. On all cases, there was available a short history and clinical findings provided by the referring physician, in addition to whatever additional information was obtained from the patient at the time of the routine fluoroscopic examination. It was found that in 39 cases the diagnosis of bronchogenic carcinoma was made, either alone or as the most probable of several possibilities. In 2 of the cases, no differential could be made, between aneurysm and carcinoma and between chronic tuberculosis and carcinoma, respectively. In 7 cases only objective findings were mentioned, the gross secondary pathology completely precluding any attempt at diagnosis of the underlying condition. In 12 of the cases, an erroneous diagnosis was offered. Of these, 3 were called lung abscess and pneumonitis, one osteogenic sarcoma of the rib, one carcinoma of the mid esophagus with extension to the lung, one lobar pneumonia, one chronic tuberculosis, one metastatic carcinoma, one advanced pulmonary tuberculosis, one pneumonitis, one pleural adhesions and fibrosis, and one was pronounced negative. It was interesting to note that with the possible exception of the one diagnosed sarcoma of the rib and the one called carcinoma of the esophagus, in which two cases the question of the more common occurrence might be raised, there was little reason to believe that any other diagnosis would be offered if the same films, accompanied by the same data, were to be reported again. This experience is not unusual and indicates that carcinoma of the lung may manifest itself in such a variety of appearances that one is apt to overlook it if not constantly mindful of it.

In conclusion it would appear that 65% of the cases studied presented roentgen appearances which were sufficiently characteristic to make a probable diagnosis of bronchogenic carcinoma. In 15% the roentgen findings were of such a nature that, although consistent with such a diagnosis, no definite conclusions could be drawn that this condition was actually present. The remaining 20% presented roentgenological evidences which were so equivocal that they suggested some lesion other than bronchogenic carcinoma. Improved interpretation with added knowledge should lessen the percentage of errors,

but earlier and more frequent roentgen examinations in obscure respiratory conditions occurring in individuals of the cancer age ought to result in its detection with greater accuracy, especially in its early stages.

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Specific therapy in hay fever was followed by complete relief in 40 per cent of the cases, marked relief in 30 per cent, fair results in 16 per cent, slight improvement in 10 per cent, and complete failure in 4 per cent. These results, showing very definite relief in over 80 per cent of patients treated, indicate the possibilities of specific treatment properly given. Ellis, R. V., *Proc. Staff Meet. Mayo Clin.* 11:469 (July 22) 1936.

THE DIAGNOSIS OF BRONCHOGENIC CARCINOMA. BRONCHOSCOPIC ASPECTS

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The bronchoscopic aspects of carcinoma of the bronchus consist essentially of the inspection of the tracheobronchial tree and the interpretation of the pathology which this direct examination reveals. Thus, the bronchoscope is used as a speculum in the same manner that an otologist uses an ear speculum. It is used to localize a lesion, determine its extent, and to secure tissue, through it, for biopsy.

Indications for bronchoscopy in those cases of definite roentgen findings are obvious. On the other hand, bronchoscopy should always be done in spite of a negative chest x-ray if symptoms of cough and hemoptysis suggest it. The possibility of tuberculosis in such cases should be excluded first by sputum examinations, in order to avoid unnecessary instrumentation. However, no matter how suggestive the findings may be, bronchoscopy should be included in the systematic study of the patient, because no diagnosis of malignancy is positive until proven so by biopsy. Classification of the lesion histologically is essential in choosing therapy, but no such classification is made at this time, because it lies outside the scope of this presentation and has been discussed fully by others. [1, 2, 3, 4]

Certain mechanical features of bronchial obstruction play so important a part in the clinical as well as bronchoscopic manifestations of bronchial neoplasm, that it might be well to review the three degrees of obstruction.[5]

If the lumen of a bronchus is partially constricted, either by an intrabronchial growth or by extrabronchial compression produced by a tumor, and air can pass the obstruction on inspiration and expiration, x-ray findings will be negative. On physical examination, however, a wheeze is heard at the open mouth and throughout the chest, loudest over the point of obstruction. As the tumor grows and the obstruction increases, air becomes trapped in that portion of the lung distal to the obstruction. This is due to a slight

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increase in the diameter of the lumen of the bronchus on inspiration, which permits air to pass the obstruction. On expiration, the bronchial wall collapses around the tumor, making it impossible for air to leave that portion of the lung. This results in an obstructive emphysema.

The roentgen picture in such a case is negative if the film is taken, as most are, at deep inspiration. A film taken during complete expiration, however, shows a marked shift of the heart and mediastinal structures away from the side of the lesion, and a stationary depressed diaphragm on the affected side.

Complete bronchial obstruction by a tumor results in absorption of air beyond the obstruction and a collapsed lung. The heart and mediastinal structures shift toward the affected side, and the diaphragm is elevated. The opposite side shows, of course, a certain degree of compensatory emphysema.

The bronchoscopic picture in these various degrees of obstruction is fairly definite. In early lesions a small stream of blood may lead to the affected area, and tissues may be removed from its source. We always collect this blood with an aspirating tube. It is centrifuged, fixed, and sectioned, and occasionally establishes the diagnosis when the tumor itself is too small or too deep in the periphery to be reached with forceps. In peripheral lesions we may resort to the biplane fluoroscope to guide us to the tumor, using special forceps designed for use in the periphery of the lung.

More frequently, however, the bronchoscopic picture is that of a large, round, firm mass completely obstructing the lumen of one of the main bronchi. Tissue can easily be "teased" off this mass with forceps used for removing ball-bearings or beads from the air or food passages. The use of this forceps is preferred to the sharper cutting type of forceps because it causes less bleeding. Should the tumor be very firm, however, there is no contraindication to the use of the cutting or tissue-biopsy type of forceps.

The more advanced type of lesion is accompanied by copious-quantities of sanguino-purulent secretion. The bronchi are distorted, the walls irregular and freely bleeding, and the true obstruction is a friable mass. Large pieces of tissue can be removed for biopsy, and the patient relieved temporarily by aspiration of the putrid material beyond the obstruction. In these cases, however, there is a certain element of danger from hemorrhage, which must be kept in mind.[6] Occasionally at this stage there has been so much destruction of tissue that the picture is confused by profuse bleeding, pus and granulation tissue. Repeated bronchoscopies may be necessary to establish the diagnosis.

Beside actually inspecting the endobronchial tumor, noting its character, exact relationship to surrounding structures and its extent along a bronchial wall, there are certain features in the bronchoscopic appearance of the remainder of the tracheobronchial tree that are of great importance. Metastases to the mediastinal glands occur early in these malignancies. Enlargement of these glands is detected by a thickening at the division of the trachea. This area, the carina, is usually sharp, regular and freely movable. With mediastinal metastases, the carina becomes thickened, irregular and fixed. Should these findings be present, lobectomy or pneumonectomy is, of course, contraindicated.

Failure to obtain a positive biopsy in a deep left-sided lesion or an upper lobe lesion is frequently due to this rigidity which makes it impossible to expose the orifice involved. Similarly, if bronchial compression of a tumor collapses a bronchus proximal to the endobronchial lesion of that tumor, biopsy cannot be obtained without danger of penetrating pulmonary tissue. The deformity and rigidity are, of course, aids in making the clinical diagnosis of cancer, and add to the information gained from x-ray and physical examination.

The most important role of bronchoscopy in relation to bronchogenic carcinoma is in establishing the differential diagnosis. An inflammatory lesion, such as a lung abscess, is accompanied frequently by a marked proliferation of granulation tissue. Bronchoscopically removed tissue from this area is the only method of establishing whether the abscess is secondary to a carcinoma or is entirely inflammatory in character.

Tuberculosis is often most difficult to diagnose, especially in its incipient stage. At this time, the symptoms of cough, hemoptysis and loss of weight are sufficient to make the diagnosis of tuberculosis, in spite of a negative chest x-ray and in spite of the fact that repeated sputum examinations are negative for tubercle bacilli.

Bronchoscopically aspirated secretion may show the bacilli, but, what is more important, an early carcinoma may be discovered. It is only by making this differential diagnosis early that cases favorable for surgery can be discovered.

Benign tumors of the bronchus offer another problem in diagnosis which can be settled only by microscopic examination of the tissue. The bronchoscopic appearance of a benign lesion is frequently quite characteristic, but, as in dealing with any tumor, the gross appearance can be relied upon only in a certain small percentage of cases.

CONCLUSIONS

1. Inspection of the tracheobronchial tree should be carried out in all cases of obscure pulmonary pathology. The early diagnosis of bronchogenic carcinoma can be made only in this manner.

2. Symptoms of cough, wheeze and hemoptysis, in spite of a negative chest x-ray, are sufficient to indicate bronchoscopy if the sputum contains no tubercle bacilli.

3. No matter how positive preliminary findings may be, bronchoscopy is indicated in suspected pulmonary neoplasm to localize the lesion, determine its extent and to secure tissue for biopsy.

4. Neoplastic disease of the lung manifests itself in most cases by one of the types of bronchial obstruction. These types of obstruction are discussed, with the endoscopic picture of each.

5. Fixed mediastinal structures, together with a thickening at the bifurcation of the trachea, are indications of mediastinal metastases, and are in themselves diagnostic features of bronchogenic carcinoma.

6. Failure to obtain a biopsy is frequently due to this rigidity, to bronchial compression proximal to the endobronchial lesion, or to the fact that the lesion lies far in the periphery of the lung.

7. The differential diagnosis of many cases of pulmonary disease is dependent upon the bronchoscopic picture and upon the tissue removed for biopsy.

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DISCUSSION

Harry Olin, Chicago: I believe that in order to obtain a good appreciation of lung carcinoma it is desirable to study many post mortem records. I do not think any clinical condition in the body can cause so much confusion as carcinoma of the lung. A study of the autopsy record reveals some interestng facts about this condition. You learn that there are six avenues by which lung carcinoma can be recognized, and I thing the roentgenologist who is primarily a clinician will be more aided than otherwise by taking an interest clinically in this work, that he may interpret more intelligently the pathology that one sees in the films.

As to the local lesions, Dr. Wachowski described them so well and covered the ground so thoroughly I have very little to offer, but I do wish to mention the other avenues through which carcinoma of the lung may begin and these are distinct from the lung itself; for instance, through the lymph stream. In addition to a Hodgkin's you may get masses throughout the body, as in the upper arm, pressure on a nerve trunk and carcinoma of the lung ushered in as a brachial neuritis.

I had a very interesting experience with one of the cases where there were essentially no lung symptoms whatever, but the patient had excruciating pain down the right arm, and that is the way the lung carcinoma was called to the attention of the physician.

There is a third avenue by which lung carcinoma may usher itself through the blood stream. You may get a mass in any organ of the body. I saw a case recently which ushered itself in by a big mass in the abdomen, which was metastatic.

Another is a mass encroaching upon a nerve trunk and giving a clinical picture of neuritis. Then we have a group of cases which are ushered in by local metastatic lesions. For example, I saw a very well-to-do farmer who had a sciatica for three months. His pain was so severe he walked with considerable difficulty. He had few or no lung symptoms, but he had a great deal of bone destruction in the left wing of the pelvis and a portion of the sacrum. Upon investigation, we found the original tumor in the lung which proved to be carcinoma.

In the skeletal system, you may get metastasis; so in summing up in regard to carcinoma of the lung, look elsewhere for lesions which may be secondary to the primary lesion in the lung.

M. Pollak, Peoria, Ill: I was greatly interested in both papers because the subject under discussion is very important since lung carcinoma is on the increase. Lawrason Brown said, "It is easy to diagnose tuber-

culosis if we only think of it." I think the same applies to carcinoma. We have to consider the fact that the x-ray appearance of cancer is not always uniform; in the same way the clinical course of cancer is not typical.

Last October we had a case, a man, aged fifty, who developed what his doctor thought pneumonia with the usual febrile course. When the fever disappeared, however, the x-ray picture remained about the same. Then a diagnosis was made of unresolved pneumonia. He had perhaps three times an acute febrile exacerbation. Finally he came to the clinic and we decided to do a bronchoscopy, and found a squamous cell carcinoma. He was sent to Dr. Graham who decided to do a pneumonectomy. When the chest was opened, he found quite extensive metastases in the mediastinal glands, involving the vena cava and decided not to proceed further. Two weeks afterward the man died and the findings were confirmed by post mortem.

I was glad to hear pointed out and emphasized the importance of sputum examinations. In every case of lung pathology when the amount of sputum is considerable and negative for tubercle bacilli, a bronchoscopy should be done.

In regard to tuberculosis, I think it is important to emphasize that if there is an extensive involvement in the lungs and negative sputum, we shall not be satisfied with a diagnosis of tuberculosis but conduct further studies, particlarly with the bronchoscope to clear up the diagnosis and then we will find cancer more often than we do at present.

Dr. Holinger (closing the discussion): In closing, I would like to point out again the aid the roentgenologist must give us in locating lesions which are deep in the lower lobe bronchi. These lesions lie beyond the point we can reach with a bronchoscope large enough to see through. Only by the use of the biplane fluoroscope can we be guided to a peripheral lesion. It is through this close cooperation of bronchoscopist and roentgenologist that we find the actual pathology in some of the very obscure cases.

RADIOGRAPHIC DIFFERENTIATION OF SILICOSIS AND ANTHRACOSIS

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In 1922 Aschoff, at the time Professor of Pathology at the University of Freiburg, Germany, called my attention to his work showing that tuberculous lesions in the lungs may be divided into two types—the *productive* type with a tendency to nodulation, consolidation and healing by fibrosis and the other or *exudative* type, a pneumonic process with a filling of the alveoli with exudate and cellular detritus. This exudative type is a much more acute disease process and its tendency is toward rapid progression, softening, caseation, cavity formation and death. There are, of course, between the two extremes of pure *nodular* or *productive* and pure *exudative* or *pneumonic,* many gradations and variations in degree of fibrosis, consolidation, caseation and cavitation; but almost without exception Aschoff found on the examination of many postmortem specimens, one or the other type predominated.

Graf and Kupferle of the Medical Department of the University of Freiburg, in conjunction with Aschoff translated these important pathological findings into terms of clinical medicine and roentgenology. They made radiographs of the chest immediately before death and then laboriously studied these radiographs in conjunction with the post mortem specimens, with the result that even with the inferior x-ray apparatus and technic of that time they were able to identify the two principal or predominant types of tuberculosis on the radiograph. Many specimens were studied; the characters of the densities on the x-ray plate were analyzed and based upon a study of these densities translated into terms of pathology it was possible to determine with a remarkable degree of accuracy the probable outcome or prognosis in any given case, because the productive or nodular type had a marked tendency toward fibrosis and healing, while the exudative type had a marked tendency toward softening, extension, cavitation and death.

On my return to America I undertook an analysis of their method at the Ottawa Tuberculosis Sanatorium (I was Medical Director of that Institution at that time) and in 68 cases, based upon the radiograph, classified the cases into productive or exudative, or if mixed, as most of them were, into predominately productive or predominately exudative, and upon these Roentgen findings I made a prognosis—stating on the patient's record that he would probably get well if of the productive type or that he would probably die if of the exudative type. These cases were followed for more than two years and I found that my prognosis had been correct 61 out of 68 times, 90% correct.

Read before Section on Radiology, Illinois State Medical Society, Peoria, May 19, 1937.

TABLE I

Tuberculosis Clinical Prognosis Based Upon Roentgen Findings

PRODUCTIVE		EXUDATIVE	
INCIPIENT		INCIPIENT	
App. cured	5		
Arrested	2		
Improved	1		
Unimproved	0		
Died	0		
Cases	8	Cases	0
ADVANCED		ADVANCED	
App. cured	7	App. cured	0
Arrested	4	Arrested	1
Improved	1	Improved	1
Unimproved	0	Unimproved	1
Died	2	Died	2
Cases	14	Cases	5
FAR ADVANCED		FAR ADVANCED	
App. cured	3	App. Cured	0
Arrested	10	Arrested	0
Improved	5	Improved	1
Unimproved	0	Unimproved	1
Died	4	Died	17
Cases	22	Cases	19
TOTALS		TOTALS	
App. cured	15	App. cured	0
Arrested	16	Arrested	1
Improved	7	Improved	2
Unimproved	0	Unimproved	2
Died	6	Died	19
	44		24

Prognosis correct in 61 out of 68 cases.....90%

It is striking how different the outcome is in the two types of cases. Thirty-two out of 44 cases of the productive type were apparently cured or arrested and only one out of 24 cases of the exudative type apparently cured or arrested; six out of 44 productive cases died in two years, while 19 out of 24 of the exudative type died in the same length of time.

These findings have been confirmed by Francis Trudeau[1] as late as 1936, who says:

"In recent years there have come to be recognized two rather distinct types of lung shadows cast on the x-ray film, which have been interpreted as indicating equally distinctive underlying pathologic changes. The first of these has the appearance of soft, fluffy smoke, with very ill defined margins. It is felt that the disease casting this shadow is apt to be both recent and active. To this type of shadow the name 'exudative' has been applied. The other type referred to is indicative of the 'proliferative' lesion, which, it is felt, is of much longer duration and more fibrous in character. Here the appearance of the lesion on the film is much more clean cut and stringy, with margins well defined. * * * Results were indeed most enlightening, for we found that 220, or 91% of our 'proliferative' group had done well, whereas only 47 or 39% of our 133 'exudative' cases had made satisfactory progress. Hence the character of the shadow and its proper interpretation are of great value in determining the future course of the disease."

These studies of Trudeau confirm my findings presented before the Chicago Roentgen Society in 1925, 12 years ago.

Since 1928, I have also had an opportunity to make an extensive study of pulmonary silicosis. At Ottawa, Illinois, we have the largest

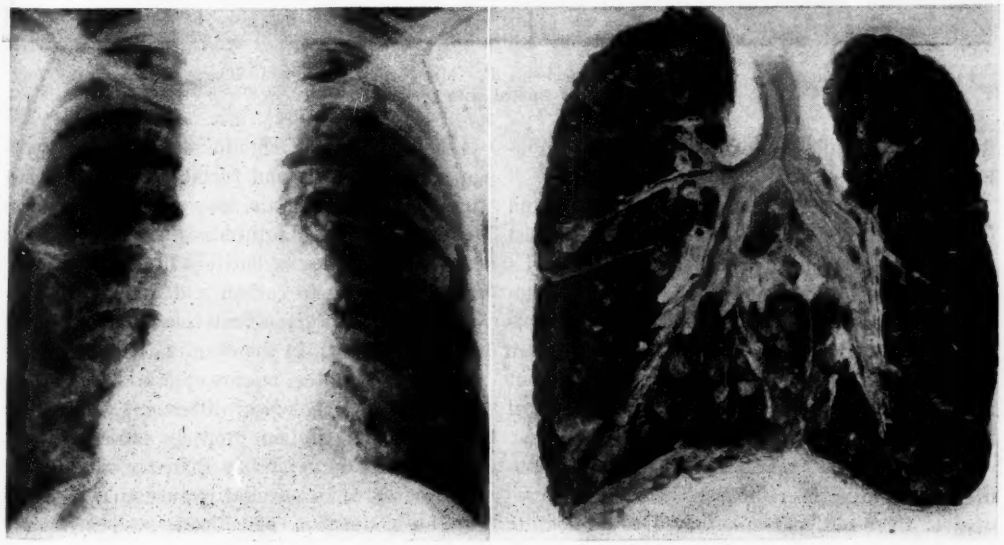

Fig. 1. Anthracosis and Bronchiestasis. Coal miner, aged 23 years. Case 463. A, radiograph during life. B, Gross specimen.

deposit of pure silica in the United States and this silica, either in its raw state or after cleaning, drying, grinding or other processing, is used in some 69 or 70 different industries. I have followed a number of employees in this silica industry with serial radiographs taken yearly over a period of eight years, and with improved technique and increased knowledge of this industrial hazard, quite definite characteristics have been noted on the Roentgen film, quite as individual as the productive or exudative densities found in the radiograph of pulmonary tuberculosis.

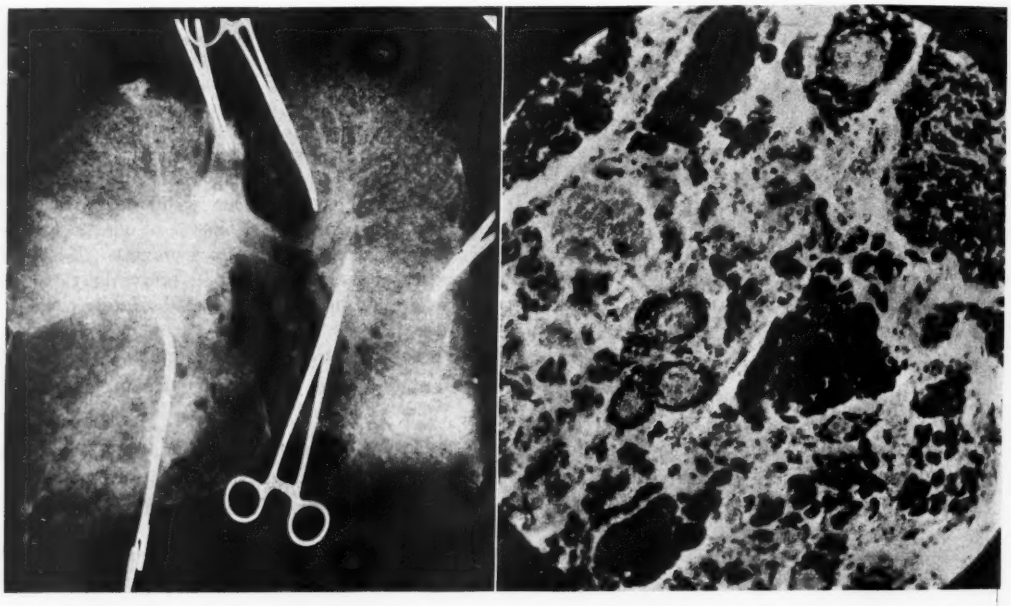

Fig. 2. A. Radiograph of post morten specimen. B. Microscopic section of lung. Anthracosis—lymph spaces choked with carbon.

In a neighboring community, at La Salle and Oglesby, we have had extensive coal mines. Most of them are shut down now, but at one time La Salle, Oglesby and Spring Valley were the leaders in coal production in the state of Illinois before the heavier and more profitable veins were discovered in the southern part of the state, but many men that spent 10 to 30 years in the coal mines still live in these communities.

During the past year I have had an opportunity to examine the radiographs on several hundred of these old coal miners and while definite lung changes were noted in many of them, the radiographic densities were decidedly different in character from those noted in the silica workers. While the radiographic densities in silicosis are discreet and sharply outlined, in anthracosis the densities have an "amorphous" mottled appearance.

The difference in the character of the radiographic densities in the two types of workers—silica miners as contrasted to coal miners—is indeed striking.

Dr. Henry Sweaney[2] of the Chicago Municipal Tuberculosis Sanatarium has made a thorough pathological study of silicosis and other forms of pneumoconiosis and found marked differences in the pathology of the lung in cases of silicosis as contrasted with anthracosis—in fact the tissue response to silica is entirely different from the tissue response to carbon and other inert dusts such as coal or iron and these differences can be clearly shown in the examination of the gross specimen and the microscopic slide. Furthermore, these pathological differences can be identified during life on properly produced radiographs even more clearly than are the densities of productive and exudative tuberculosis.

The nodulation of silicosis as seen in the pathological specimen is an almost specific fibrous tissue reaction (if uncomplicated by tu-

berculosis) while the reaction to anthracosis is essentially a blocking of the lymph spaces by particles of carbon and the fibrous tissue response is minimal. These differences with careful technic and proper contrast, density and sharpness can be clearly demonstrated on the Roentgen film during life and after death.

Silica produces a specific fibrous tissue response—inert dusts such as carbon do not.

These differences in tissue response are clearly shown in the accompanying photographs from Dr. Sweaney's[2] two illustrative cases. In the radiographs during life, the post mortem specimens, the post mortem radiographs and in the microscopic specimens—one a coal miner with lungs filled with carbon, the other a rock miner with silicotic nodules and superimposed tuberculosis.

I have found in the radiographic study of several hundred cases in each group that these pathological differences can be demonstrated during life by radiography in the same way productive tuberculosis has been differentiated from exudative tuberculosis. These differences, pathological and radiographic, are best shown by the accompanying illustrations. These studies are being continued and a later, more detailed report, of the technic, etc., will be made.

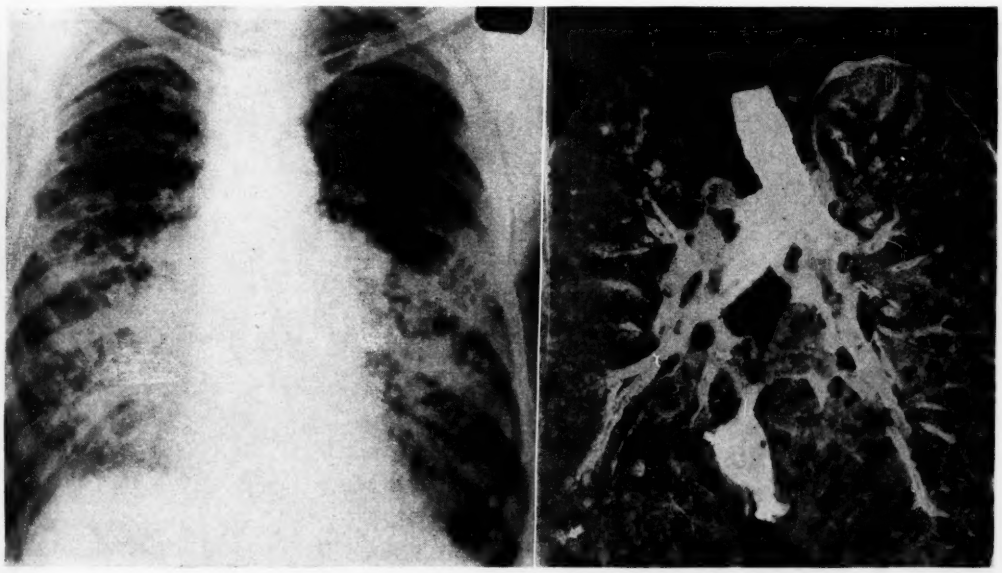

Fig. 3. Silicosis with superimposed tuberculosis. Rock miner, for 18 years. Case 579. A. Radiograph of predominant silicosis with superimposed tuberculosis. B. Post morten gross specimen of lung.

CONCLUSION

In silicosis there is a production of fibrous nodules—in anthracosis a blocking of lymph channels by a foreign body. The radiographic differences are striking. With our new occupational disease law—which I consider an admirable one giving adequate protection to both employer and employee—these radiographic findings and this differentiation, I believe, will have considerable value in adjudication of claims for disability due to silicosis and other forms of pneumoconiosis.

DISCUSSION

Paul Dick, Chicago: I think Dr. Pettit has covered rather well with his slides and discussion all of the particular points. Perhaps the only thing I might add is the pathology or pathological change that takes place with the entrance of the dust particle. The white blood cell surrounds the particle of silica and takes it out into the lymph space. After a few of these have accumulated, they gradually block the lymph space or channel at that particular point. After the white cell has surrounded the dust cell the irritation has not been eliminated and there is a chronic irritation from some of the dust cells, which continues to produce the fibrous tissue change which gives us the particular shadows he showed, both by the roentgenograms and the lantern slide, which is typical of silicosis in differentiating from the other forms of pneumoconiosis.

I feel that the early cases of silicosis have more of the form of productive type than the later forms. As

the condition has gone over a period of years, the fibrosis is greater and the density of the shadow increases as the silicosis has attained several years standing.

Henry Sweany, Chicago: This subject, of course, is one that is dear to me, and I have been much interested in it in recent years. I was much pleased to hear that Dr. Pettit was working on a method by which we may be able to differentiate the various forms of pneumoconiosis before death.

You know it is easy to do a post mortem with a chemical analysis and go through with the complete analysis of such a case and make a diagnosis after run down the line for others, the rare elements in the body, such as iodin, silica and compounds like that which help to obstruct these rays in order to produce a shadow on the film.

What develops when we see a normal chest, what do we see? We see some large branchings out from the hilum, most of which are due to vascular shadows. The vascular shadow out from the hilum is made up of really the two components. The first is the blood itself,—the blood stream itself containing a certain amount of iron. Next is the wall of the vessel. Both of those things go into the vascular hilum shadow. All of us recall having seen those little round shadows

Fig. 4. A. Radiograph of post mortem specimen. Case 579. B. Microscopic section of lung. Silicotic nodules.

1. *J. A. M. A., 106: 592, 1936.*
2. Archives of Pathology, *22: 593, 1936.*

they have once died, but if you do that before death it is not nearly so easy. After all, from a standpoint of benefit to the individual, that must be done if you are ever going to practice medicine as we are supposed to do.

The work that Dr. Pettit has suggested here in using this high-speed Bucky diaphragm, I believe, is a move in the right direction to differentiate these different lesions that are really fundamentally different in their make-up, and at least, so far as the pure types of these respective diseases are concerned, it is going to lay a foundation that will be very useful for the future.

In making a study of the chest roentgenograms, it would be very well to ask ourselves: What is it, after all, that causes the shadow on a roentgenogram? We must get down to fundamentals on that and decide that it is really certain chemical elements. Perhaps the most important of the chemical elements is calcium and next most important would be iron. Then we can on the roentgenogram, which are soft and smooth and either round or oblong, produced by the blood vessel when you see it on end. But the fibrous tissue that goes into the wall of the artery also casts a shadow, and in that fibrous tissue we have a certain amount of calcium, a certain amount of silica, a certain amount of chemical elements that make up the shadow.

What happens when we have disease? When you have a disease that gradually develops in the lung from the hilum outward, as we have in these pneumoconioses, you have first a plugging of the lumph vessels and an increase of fibrous tissue around these lymphatics and in the intravascular spaces that helps to exaggerate the hilum shadows, and a disease such as whooping cough, pneumonia and similar diseases will leave a scar of fibrous tissue that will exaggerate that shadow.

When you have a lung full of coal pigment and the lymphatics also filled with coal pigment, that shadow is also exaggerated. But when you have silica present,

there is something in addition to this stretching and plugging of lymph vessels. In addition, there is the slow development of these fibrous *"whorls"* that in later stages of the disease appear as soft round shadows on the roentgenogram, beginning from a millimeter or less in size and gradually enlarging to five millimeters or more in diameter.

When the silicosis is a pure type of involvement it is rather characteristic. You all know how they spread out from the hilum and how it is practically evenly distributed, perhaps a little more on the right. But you rarely see silicosis in its pure form. What you do see is a blending out of the margin of these nodules and increase or decrease in the densities, one from the other. What is the cause of that?

My observation has suggested to me very strongly that when you begin to see a difference in the margins *of these nodules and when you begin to see a difference* in the densities then you can begin to suspect that *tuberculosis is making* its inroads into the silicotic nodules. Why are they more dense? Simply because in the caseous nodules you also have a gradual accumulation of calcium.

In summarizing them, you have, in the first place, your vascular shadows, and your exaggerated vascular shadows by fibrous tissue running along parallel to the vessels as you have in ordinary coal dust disease,—*pneumoconiosis due to coal dust. Then you have the* beginning of the nodules, the specific nodule of silicosis, which itself has its characteristics, rather soft, even, *round; on top of that again your incoming* tubercle bacilli that obliterates all the smooth markings, makes the edges fuzzy and changes the density from smooth, even density to one of irregular density and one that shows evidence of what we think is calcium.

I see no reason, therefore, why further advances are *not feasible in differentiating these various changes.*

Dr. M. Pollak, Peoria: *I* was very much interested in Dr. Pettit's paper and greatly interested in Dr. *Sweeney's discussion and exhibit. I think it would* have been worth while for me to travel quite a distance to see the exhibit and to hear this paper, because I learned quite a good deal about silicosis.

Silicosis is becoming more and more important, particularly in the industrial states. You know that since *last year we have had in Illinois the statute covering* occupational diseases including silicosis. A great deal will depend on the x-ray man in diagnosing silicosis. *and he can make or break factories and through them* uphold or destroy the life of industrial communities.

In *silicosis, the occupational* history is quite important. We must remember, however, that we may find silicosis not only among people who are working in plain silica dust but also in other dust. In my short *series* of cases of *silicosis, I found a painter doing* nothing but painting. At the age of fifty, he developed *silico-tuberculosis, proven at post mortem.*

In general, we pay little attention to another form of pneumoconiosis. The attention given in text-books *to anthracosis is negligible. Considering anthracosis, I* have a series of films, I would like to show, of a man whom I have observed over two years. The question in my mind in this case was whether he had silicosis or lung tumor. We went into the industrial history of the man and found that from the age of seventeen to the time he died at fifty, he was doing nothing but work as a stationary fireman. On that basis the diagnosis of silicosis was discounted. I thought he might have a tumor and thought also of syphilis, the lesion being in the lower lobes, but the Wassermann test was negative. We had a post mortem and what we thought to be a tumor on the x-ray film was a very dense fibrotic mass caused by anthracosis. The lung was *hard as stone and all the periphery was filled with* bullous emphysematous blebs. Death was due to heart *failure. I believe we cannot discard anthracosis as a* negligible thing as we usually do.

Dr. Pettit (closing the discussion): I feel with improved technique and with the knowledge of the things we interpret, we are going to more sharply differentiate the things we find on x-ray examination.

THE CONVALESCENT CARE OF ANTERIOR POLIOMYELITIS

SIDNEY SIDEMAN, M.D.
CHICAGO

Many of the patients afflicted with infantile paralysis during the recent epidemic, are now in the convalescent stage of the disease.

The course of infantile paralysis, known scientifically as anterior poliomyelitis, is divided into three stages, from the point of view of paralytic involvement. The first or acute stage constitutes the period from the onset of paralysis to the disappearance of muscular tenderness. This lasts from two to six weeks, but may persist longer. The second or convalescent stage begins at the *cessation of muscular tenderness and terminates* when there is no further improvement in muscle strength, in spite of *adequate treatment. There is no time limit to this phase of the disease,* but in most cases it is at least two years. The third *stage, or the stage of residual paralysis, begins* when there is no further improvement of muscle strength and lasts the remainder of the individual's life. It is during this last stage that all the reconstructive surgery should be performed to enable the patient to obtain the maximum degree of functional activity that it is possible for one or more operations to provide. Your orthopedic surgeon knowns how to reconstruct and re-habilitate and he may be able to perform some so-called miracles which result in the discarding of crutches and braces forever. Unfortunately

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there are some patients so severely paralyzed that there is little or nothing left to reconstruct. Also, there are some patients so inadequately treated during the very important convalescent stage, that the maximum muscle power is not obtained and the deformities are multiple and severe. With adequate care during the convalescent stage, it should be possible to prevent most deformities, even if the disability cannot be overcome. For this reason, it is the duty of anyone responsible for a patient in that phase of the illness, to have an adequate appreciation of convalescent-stage care in infantile paralysis.

One of the most important advances in the care of patients afflicted with infantile paralysis is the realization of the fact that this condition is not hopeless and that orthopedic treatment offers great benefit. The orthopedist utilizes mechanical methods to improve the function of the paralyzed part. These methods consist of proper rest, graded exercises, apparatus, physical therapy and surgical precedures. Orthopedic treatment should be instituted immediately on the appearance of even the slightest degree of muscle weakness.

The degree of loss of muscle strength can be graded according to one of the accepted methods. A popular classification of muscle power is one based on the rating of each muscle as absent, trace, poor, fair, and good. Physical therapists are trained in muscle examinations and can grade individual muscles. These grades are recorded on special charts which list all the muscles of the body. Properly kept records of repeated muscle tests reveal at a glance the progress of the patient. When the record shows "absent" or "trace" muscle gradually become poor, fair or good, it is of the greatest encouragement to patient and family, and means more than the trite phrase "you are getting stronger".

Muscle tests should be repeated frequently during the acute stage and continued at regular intervals during the convalescent stage. After the acute phase has subsided it is only necessary to test the involved muscles.

The treatment during the acute and convalescent stages has as its object the restoration of muscle power, the prevention of deformity, and the maintenance of circulation. Restoration of muscle power is obtained by a program of rest and exercises. At the beginning, rest is the most important but as the convalescence progresses, exercises are gradually given more time. Exercises must be started slowly and gradually increased, keeping in mind that fatigue, local or general, is harmful. Stop exercising before the onset of fatigue.

The prevention of deformity requires careful vigilance and necessitates the application of splints.

Maintenance of circulation is necessary for proper nourishment of muscle tissue. Stimulation of circulation will faciliate the return of muscle power. Local heat is the best method of aiding circulation and this may best be applied in the form of radiant heat by means of a simple incandescent lamp baker or radiant heat lamp such as the infra-red. Electric pads and hot water bags may be used. Diathermy and the induction forms of heat may be prescribed by the attending physician if he desires. They are useful adjuvants but by no means a necessity. Ultraviolet lamp is of value only for its tonic effect. It is not primarily a heat-producing apparatus.

Rest during the acute and early convalescent stages is the most important therapeutic agent. This means mental as well as physical rest. It cannot be over-done. The anxious parent or patient must realize the importance of a prolonged period of inactivity. They must be patient and not criticise their physician for enforcing rest or for his refusal to get the patient up out of bed.

There are some authorities who believe every patient should be confined to bed at least one year from onset of illness. This is not necessary in most cases, but it certainly is advisable for many individuals. The patient must be kept quiet, flat in a bed that has boards between the mattress and springs, and the involved part placed in a splint. The splints may be made of wood, of wire and cloth, of plaster of paris, i.e., removable casts, and of aluminum. They must be properly fitted to provide support and protection. They must maintain the involved part in the appropriate position without constriction. After a while, splints can be removed and braces applied which fulfill the requirements as to proper position of part, avoidance of constriction, simple adjustment of joint mobility and strength of materials, but lightness of weight.

The desired position of immobilization in

splints is dependent on the localization and degree of involvement. Your medical adviser knows how to determine these positions. As a general rule the parts are to be placed in the normal position for function. When the paralysis is not complete the weaker antagonist of each group should be favored by a position of relaxation. Each individual presents his own splinting problem and it is the physician in attendance who determines the proper position.

The muscles of the trunk and abdomen, being accessory muscles of respiration, cannot be immobilized but they can be protected by a removable plaster cast, corset or brace. Curvatures of the spine have developed under strict, painstaking care in the best hands and no one can be criticized. They are difficult to prevent.

It is during the convalescent stage that the greater part of the return of muscle power is obtained. The most important method of obtaining this increase of muscle power is by means of carefully graded voluntary active muscle exercises. The method is known as muscle training or re-education. The exercises are best administered by a trained physical therapist but can be given by a nurse, parent or attendant previously instructed by one who has had special training (A detailed description of suitable exercises can be obtained from the United States Public Health Service, by requesting Reprint No. 1197.)

Muscle training should be preceded by heat and massage to thoroughly warm the part and improve the circulation which increases the contractile power of the muscle. Massage should be manual and not by mechanical vibrators.

Throughout the period of muscle training, success depends on the faith and cooperation of patient and enthusiasm and perseverance of the therapist.

Exercises are given in bed or on a firm cushioned table and are called "dry". They are also given under water and are caller under-water gymnastics. The water should be warm, 88 degree to 90 degree F., and can be in a specially constructed tank easily obtained and set up in the home, or in a pool at some institution.

The use of direct electrical stimulation of muscles in infantile paralysis has authorities divided; some for, others against. In my opinion it is of little or no value and in the acute stage, of definite harm.

The patient in the convalescent stage should be given nourishing foods and whatever medication and tonics the attending physician deems necessary. Underweight individuals should be encouraged to gain, overweight individuals should be brought down to normal by a suitable diet that will not lower their resistance.

THE CONTROL OF MENOPAUSAL SYMPTOMS

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With the increasing use of radiation methods to control uterine hemorrhage, uterine fibroids, uterine cancer, etc., there is a corresponding interest in the most effective treatment to relieve the vasomotor symptoms (hot and cold flashes, perspiration, vertigo, faintness, tachycardia, gastrointestinal disorders, numbness and tingling of the hands and feet, various paresthesias and vicarious bleeding), probably the most distressing manifestation (in varying degrees), incident to menopause in some patients.

The menopause is of three general types (natural, artificial and premature), the symptomatology being essentially the same for all and is definitely an endocrine disturbance. Cessation of ovarion function (hypofunction) is the primary causative factor. The withdrawal of the ovarian hormone simply initiates the endocrine disturbance and the symptoms accompanying it are probably due to hyper or hypo-function of other endocrine organs (thyroid, adrenal and pitutiary) with hyperfunction of the pituitary as probably the most noticeable change.

The proof of ovarian deficiency is easily seen in the analogy of the symptoms exhibited after surgical castration, also by the relief of the symptoms through the administration of the standardized follicular sex hormones. It has also been demonstrated[1] that there is an excess of anterior pituitary sex hormone (prolan) in the circulation of nearly 60% of menopausal (natural or artificial) women. This seems to be a compensatory hyperfunction of the anterior

pituitiary and appears to be of a transitory nature in most instances.

Novak,[2] (Associate in Gynecology at Johns Hopkins) states: "It should, first of all, be emphasized that the majority of menopausal women need no organotherapy whatever, for either the symptoms are very slight, or they are controllable by such simple measures as reassurance, insistence on the avoidance of physical or mental stress or worry, and perhaps the use of such simple nerve sedatives as the bromides. In a minority of cases, however, and not infrequently also in the artificial menopause, produced by radium therapy or operation, the symptoms may be so distressing as to call for efforts at relief."

It has been estimated that while 80% of patients have vasometer symptoms in different degrees in the natural menopause, only about 5 to 10% have symptoms severe enough to demand special treatment. Keene[3] (Prof. of Gynecology, University of Pennsylvania) states that for some unknown reason the menopausal symptoms are usually more intense and persistent following irradiation than surgery. He also states that in operations, "even with ovarian conservation, severe menopause symptoms will occur in 7%; when the uterus has been amputated sufficiently high to permit of menstruation, the menopausal symptoms are largely eliminated. With hysterectomy, the reproductive function is lost and the onset of the menopause will be earlier than normal."

Incident of Radium Dosage. Keene believes that the incident of intense menopausal symptoms following radium is largely influenced by the radium dosage. In a series of 391 patients treated with radium for functional hemorrhage he noted the following:

Number of Patients	Age	Severe Menopausal Symptoms	Bleeding Controlled	Radium Dosage in Mg. Hours
21	Less than 20	0%	88%	200 to 500
84	20 to 30	8%	88%	200 to 500
91	30 to 40	21%	95%	200 to 1200
165	40 to 50	31%	99%	400 to 1200
30	50 to 60	3%	100%	600 to 1200

Keene believes that the ovaries in patients from 20 to 30 are highly resistant to radium or they possess a strong recuperative power; that increasing susceptibility to irradiation begins after 30, gradually increases and reaches its height in patients who continue to menstruate after 50. He considers the 200 to 500 milligram hours dose ideal in patients under 30.

Keene[3] observed that in patients from 30 to 40, who are given only 200 to 300 milligram hours, 80% have their hemorrhage controlled with no permanent amenorrhea and no severe menopausal symptoms:

"With gradual increase in dosage, there is a rapid increase in menopausal symptoms until with 800 to 1200 milligram hours, permanent amenorrhea occurred in 56% and severe menopausal symptoms in 47%. In fairness to radium therapy, let us analyze the initial dosage in this group. We find that the average dosage was much larger than it should have been and the conclusion is warranted that these unsatisfactory results (several menopausal symptoms) are due not so much to the fault of the method as to its application. . . . We believe that with a reduction of the initial dosage to 300 milligram hours and an increase of not more than 100 milligram hours in case re-radiation becomes necessary radium therapy is the method of choice in this group."

Keene observed that in the 40 to 50 age group, 97% had their bleeding controlled with an initial menopausal radium dose (800 to 1200 mg. hours) but with severe menopausal symptoms in 38%; with 600 to 700 milligram hours, the bleeding was controlled in 87% with the incident of menopausal symptoms 19%; with 400 milligram hours, bleeding is controlled in over 80% with a still smaller per cent of reactions:

"So[3] impressed are we by the results of this study that we propose to give the 400 milligram hour dosage a trial in women near 40 years of age. Should this and a re-radiation dosage of 500 milligram hours fail we believe operation should be considered because in the end, it is a more conservative measure than increased irradiation. In women near 50, increased radium dosage or roentgen therapy can be used because the incidence of severe menopausal symptoms will more nearly approximate that of the uninduced menopause.

"Between 50 to 60 years of age the results of radium therapy approach perfection. Maximum dosage can be given almost with impunity since severe menopausal reactions develop in but 3%."

HORMONE THERAPY — Kurzrok[4] (Columbia University Medical Center) has recently published his observations of ten years' laboratory research and bedside study of the endocrines in obstetrics and gynecology. This book is probably the best written and most practical to appear and incorporates the many recent discoveries in endocrine physiology. His method of treating the climacteric has been to rely chiefly on the administration of estrogenic hormones. The relative merits of the various commercial estrogens

in the treatment of menopausal symptoms has not yet been determined. There are a number of these preparations reported useful in this condition (and approved by the Council on Pharmacy and Chemistry of the A.M.A.) marketed under many names leading to considerable confusion: 1. estrone or theelin (theelin, P. D. & Co., amniotin, Squibb); 2. estriol or theelol (theelol, P. D. & Co.,); 3. estradiol or dihydrotheelin (progynon-DH, Schering); 4. estradiol benzoate (progynon-B, Schering); and 5. estriol glycuronide (emmenin, A. M. & H.). The unit of dosage is the so-called Allen-Dorsey rat unit (R.U.) or mouse unit (M.U.) one rat unit being equivalent to 5 mouse units. Some clinicians prefer the League of Nations International Unit (I.U.) and usually one rat unit is considered equivalent to from three to five international units.

The following is quoted from Kurzrok's[4] interesting text:

"The chief therapeutic agents for the treatment of the climacteric are estrone, calcium and such therapeutic measures as each case may specifically require. We take cognizance of the fact that the number and intensity of symptoms vary from patient to patient and that women differ a great deal in temperament. Hence, there can be no cut and dried method of treatment. It has been argued in many quarters that the therapeutic results obtained are merely suggestive. We do not deny that in some patients there is a distinct psychic element, but in our experience it does not involve more than 10 or 20% of the cases. It has frequently seemed to us somewhat bizarre that the loudest exponents of the suggestive results idea have never themselves treated a patient.

"The results of therapy can be verified experimentally by the vaginal smear test as demonstrated by Papanicolaou and Shorr (1936). These investigators found that the vaginal smear test furnishes a simple objective guide for the treatment of the menopausal syndrome with follicular hormone. With an adequate amount of estrone, there occurs a transformation of the vaginal smear from the menopausal to the leucopenic type, with the large flat cells, largely cornified, with small pyknotic nuclei. This is the type of smear which is found normally during the high follicular phase of the menstrual cycle just prior to ovulation. This change in the smear is generally associated with relief of the menopausal symptoms.

"Estrone should be given in large doses. It is best administered hypodermically, though the oral route may be used. Oral administration required from five to twenty times the hypodermic dose. It has been our custom to begin with 50,000 I. U. (1 R.U. = 5 I. U.) of follicular hormone (amniotin or progynon-B) twice a week. The injections are always given with a 20 gauge needle intramuscularly into the buttocks. Subcutaneous injections produce painful lumps. As the vasomotor symptoms diminish the number of injections is decreased until one dose every ten days is reached. Maintaining the same frequency of injection an attempt may be made to use less than 50,000 I. U. per dose. Either the patient's symptoms or the vaginal smear may be used as a guide. It is not advisable to increase the intervals between injections beyond two weeks, for there is a recurrence of symptoms. Adequate treatment results in a definite decrease in the number of sweats and flushes per day, namely, from one every half hour to one or two per day. There is a definite increase in energy and sleep becomes more restful and refreshing. We must stress the importance of adequate and frequent dosage. Insufficient hormone is equivalent to none at all, for it leaves the patient discouraged with the treatment.

"During the past few years we have injected in addition to estrone, an alcohol-ether extract of the entire ovary. It is commercially available in the form of Sistomensin (Ciba). The basis for the use of this extract is as follows. One is frequently asked whether estrone and progesterone are the only hormones in the ovary. May there not be others whose function is not as yet clearly defined (Kaufmann, Muller, and Muhlbach, 1932; Laqueur, 1933) but whose action is on the general metabolic processes, the blood vessels, blood cholesterol, fat metabolism, etc.? (F. Laqueur, 1934.) It has been our impression (based on its use for more than 400 cases in 5 years) that when Sistomensin (1 cc.) is added to the injected estrone the therapeutic effect of the latter is enhanced. This applies only to the relief of the vasomotor symptoms.

"The third therapeutic agent that we have routinely used is calcium. The reasons for its use are as follows: Many of the symptoms frequently encountered during the climacteric are due to disturbances of the vasomotor system—such as sweats, flushes, palpitations, etc. We believe these to be due to an increased irritability of the vasomotor system. Calcium depresses the irritability of the cell, hence its use in this connection. The salt used is the gluconate in doses ranging from 2.0 to 5.0 grams per diem.

"The question is frequently asked: How long should treatment be continued? Does treatment prolong the duration of the climacteric? Our belief is that treatment should continue as long as distressing symptoms are present, whether it takes five weeks or five years. Patients will vary tremendously in their ability to endure uncomfortable sensations. Hence, the psychic make-up of the patient must serve as an additional guide in our therapy. Every effort should be made to lessen the frequency of injections, and finally to replace injections by oral medication. We are constantly being supplied with tablets having greater potency (1 tablet—3,000 to 10,000 R.U.) but it must be remembered that it takes from 5 to 20 times as much follicular hormone to produce an effect when given by mouth as by injection. We feel that treatment neither lengthens nor shortens the duration of the climacteric. Its duration is a function of the individual

as an entity. The aim of our present treatment is to alleviate symptoms. What tomorrow will bring we cannot prophesy."

RADIATION TREATMENT — Sedatives or the follicular hormone, alone or in combination, will not relieve menopausal symptoms in all cases. Furthermore, while the estrogenic substances alleviate most symptoms their use is transient in effect and purely substitutional. These facts have stimulated inivestigators to look for other therapeutic agents that might be more effective.

The presence of a hyperactive anterior pituitary in the menopause has been mentioned above. In recent years a number of investigators have observed the effects of irradiating the pituitary in this condition. One of the most interesting recent studies along this line is by Collins, Thomas and Menville[5] (Tulane University) who claim that irradiation of the pituitary affords more marked relief and for a longer period with more lasting effect than any other known type of therapy and that it should be employed in all cases in which relief is not obtained from sedatives or the follicular hormone. A summary of their work:

"In[5] 33 patients the irradiation dose for each exposure was 148 r with the following factors: distance 12 in., 5 ma., 150 kv. 1 mm. Al and 0.25 mm. Cu. eight minutes. The first exposure was given through the temporal region and repeated on the following day to the left side, and three weeks later the same procedure was repeated. Only one patient, with surgical menopause of several years duration, failed to improve. In 17 cases the menopause had been surgically induced and in 16 was natural. Improvement is most often noticed during the third week of treatment, and complete relief is obtained three weeks after the last exposure. Investigations have shown conclusively that hypertrophy of the anterior portion of the pituitary with increased prolan secretion occurs at the menopause. An attempt will subsequently be made to demonstrate that the relief of symptoms afforded by irradiation is accompanied by disappearance of excess prolan and that this is the effect of a destructive dose of roentgen rays to the hypertrophied pituitary."

In commentating on the above work, Kaplan[6] (Clinical Prof. of Surgery, New York University) states: "A well worth while procedure and one from which we have obtained favorable results in over 90% of cases treated."

It should be noted that the above irradiation procedure was carried out on patients who either had a natural or a surgical menopause, no mention being made of a radiation menopause. Since the symptoms of the surgical and irradiation menopause are practically the same it would appear that what would prove effective treatment in one would also be effective in the other. However, we know of no reported studies where this dual type of radiation therapy has been carried out (irradiation of pituitary following pelvic irradiation to produce an artificial menopause).

A deterrent to the not too persisent or too prolonged treatment with estrogenic substance is the fact that they have been proven to be carcinogenic in animals.

"Another[7] possible deterrent to persistent hormone therapy is the fact that within the past few years a number of reliable investigators have been able to produce malignant neoplasms in animals by repeated estrogenis hormone injections. This has been repeatedly confirmed by research workers in a number of institutions. Loeb (Prof. of Pathology, Washington University School of Medicine) states, 'The carcinogenic hydrocarbons of tar and related compounds, estrogenic substances as well as certain other factors, in the course of time may induce cancer formation in those tissues on which they act.'

"The production of human cancer from such injections is yet to be shown. Kaplan (Director, Division of Cancer, City of New York and Clinical Prof. of Surgery, N. Y. University) states: 'Unfortunately, in the enthusiasm for a new science the dangers of increased hormonal action have been overlooked in the haste to effect relief of functional disorders. Recent experimental studies have shown the possibilities of increasing malignancy formation through hormone stimuli. This suggests that caution is required in prescribing persistent therapeutic use of such substances. . . . As radiology offers proved, valuable therapeutic aid in functional dyscrasias, other remedies which may produce untoward effects are less properly indicated.'

"Further evidence that caution should be used in the administration of the hormones has been expressed by Curtis: 'Long continued injection of large doses of theelin produces sclerosis of the ovaries. The inherent harmfulness of excessive luteinizing hormone is also evident in the lutein cysts which are the physiologic accompaniment of chorioepithelioma. Again implantation of anterior pituitary substance into adult mammals causes the development of ovarian cysts rather than a stimulation of follicular activity, thus suggesting a possible injurious effect which may accompany administration of the pituitary hormone of the future or its present-day substitute, the urinary anterior pituitary-like substance. Ovarian preparations of various sorts, administered orally, chiefly in tablet form, have enjoyed unmerited popularity. They are mostly inert and worthless. Corpus luteum, for example, is entirely inactive when given by mouth.'"

SUMMARY

There is much work to be done before our knowledge of the climacteric is complete. Be-

cause our knowledge is incomplete, the results of treatment are not always satisfactory, but the rational of treatment, both hormonal and radiation as outlined above, is worthy of careful consideration.

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THE MANAGEMENT OF THE THIRD STAGE OF LABOR

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The purpose of this paper is to emphasize 1. more intelligent care of the labor case after the delivery of the fetus, either full-term or premature, 2. more gentle handling of the uterus and its contents after the termination of the second stage, 3. prevention of infection and hemorrhage in the third stage, 4. the management of several pathological conditions in regard to the placental stage of labor.

The writer is well aware that on the management of the third stage of labor much has been written and that the clinical manifestation and the mechanism of the third stage of labor have long been known. The only changes have been those produced by the attendant himself on the individual case. It remeains therefore that anly a brief review of the outstanding principles of this important phase of the obstetrical case be submitted. It seems that any attempt to reduce hemorrhage and infection should be helpful in these days when so much is being written on maternal mortality, morbidity and the lay criticism of the medical profession especially in obstetrics. It has been stated that more mothers died in the third stage of labor than in the other two combined.

Since 1861 the management of the third stage has been quite standardized. Before that period Williams[1] tells us that the placenta was removed by traction on the cord or manual removal of the placenta from uterus or vagina with the resultant high mortality and morbidity. Crede in 1853 described his method of immediate expression of the placenta and made the first great step in the prevention of infection and hemorrhage. His immediate expression met with considerable opposition claiming that it produced a greater loss of blood and caused more post partum hemorrhages. However this method, with some modification, is still in vogue throughout the world today. Williams also states that the method of Crede had been practiced as early as 1767 in the Rotunda Hospital in Dublin by John Harvie.

No one definitely knows what determines the site of implantation of the fertilized ovum. It is known that the usual site is well up in the anterior or posterior walls, sometimes more or less laterally, very rarely in the fundus and quite infrequently in the region of the cervix. These facts are in keeping with anatomy of the pregnant uterus, in that the walls of the contractile portion of the uterus are lined by a thick layer of rich decidual soil which is presumable ideal for implantation. Likewise this decidual soil is scanty in the lower uterine segment and absent entirely in the cervix itself.

With the termination of the second stage the normally implanted placenta begins to separate from the uterine muscle, the uterine contractions bringing about a decrease in the size of the original area of implantation. These contractions as reported by Frey and Foster[2] begin anywhere from a few seconds to three and one-half minutes following the birth of the child. This was recorded by the use of a hyster-otonograph. They show with considerable evidence that the expulsion of the fetus is not followed by a rest period of uterine activity as was heretofore assumed. The placenta continues to separate with these contractions but the membranes cling to the uterine wall and are generally removed by gentle traction on the placenta as it presents at the vulva. This may be well seen at Cesarian section when the uterus has been opened.

There are two methods of extrusion of the

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placenta described, namely, the Scultze and the Duncan. In the former the separation begins at the most central portion of the placenta and as the retro-placental hematoma grows, forces the fetal surface to present at the internal os. The experiments of Weibel[4] and Warnekros[3] proven by x-ray conclude that the placenta always leaves the uterus in the same manner and that the Duncan or Schultze method are developed in the vagina. Also that the retroplacental hematoma has very little to do with the separation of the placenta. They state further that separation occurs nearly always with the first or second contraction. What should be emphasized at this point is the importance of waiting for uterine contraction after the termination of the second stage of labor before any attempts are made to express the placenta. The mechanism of the third stage, that of separation and extrusion has been briefly described.

In these days when so much is being done to relieve the pains of labor we are unintentionally interfering with the normal mechanism of third stage and the clinical manifestation of the normal third stage may be entirely absent. It has been been repeatedly observed that the uses of analgesic drugs prevent the firm contraction of the uterus following the termination of the second stage with the increased loss of blood. It matters little, likewise, whether these drugs have been administered hypodermically, rectally, by mouth or by inhalation. In a study of 1,860 cases now under observation at the New York Lying In Hospital it has been learned that the drugs that produce relaxation always increase the blood loss. In their series with nembutal and rectal ether the incidence of hemorrhage (600 c.c. or more) was 18% in contrast to the normal of around 6%. In the group of cases having analgesia they report 8.5% as compared to the group having no analgesic drugs given of 5.8%. Therefore it seems well to emphasize that immediately following the birth of the child the subcutaneous administration of ½ c.c. of obstetrical pituitrin has many advocates. Attempting to stimulate uterine contractions which are materially interfered with by the use of drugs producing relaxation of the maternal musculature seems justified. At the Boston Lying In Hospital ½ c.c. of infundin is given immediately after the baby is born and the results have been reported to be very satisfactory.[5]

The practice of active massage of the uterus immediately after the birth of the child is, in the opinion of such authorities as Baer,[6] unnecessary and harmful. If the uterus is observed it can be outlined with the eye in most instances provided that the patient is not too extremely obese. Unless the uterus is rising noticeably with intrauterine hemorrhage the hand need not be placed on the organ, if necessary, however, only lightly massaging the anterior surface which often is sufficient to stimulate contractions. By keeping the hands entirely off the uterus only to palpate and diagnose separation, much hemorrhage can be prevented and a normal mechanism of the third stage will often take place. The separation of the placenta is noted by the hatchet shaped dome, slight asymmetry and the lengthening of the cord. Many times a slight trickling of blood may be noted at the vulva. With the descent of the placenta the hollow just in front of the symphysis pubis will be obliterated if the urinary bladder is empty. The separation of the placenta and descent into the lower uterine segment or inactive portion of the uterus may be surmised if the above points have been completed. After one is then assured of separation, by the most gentle expression with the heel of the palm on a firmly contracted uterus, the placenta and membranes may be expressed with the minimum loss of blood; the average being 250-300 c.c. With this minimum loss of blood we lower the morbidity of the puerperium so well known to all. It may also be mentioned at this point that the placenta should be expressed immediately after its separation and not after the conclusion of repair of perineal lacerations or episiotomies. There is nothing to be gained by waiting after the placenta has separated and hemorrhage may be invited.

The plan of treatment therefore recommended is ½ c.c. obstetrical pituitrin subcutaneously and watchful control of the uterus with mild expression when signs of separation and descent are present. All methods that compress or push the uterus forcefully downward toward the floor of the pelvic cavity are unnatural and should be labelled with disapproval. Such methods interfere with the normal mechanism of separation of the placenta, bruise and contuse the uterine muscle, cause unnecessary bleeding and carry the possibility, while rare, of inversion of the uterus, a catastrophe in itself. It is certainly not beyond

the realm of possibility to assume that existing birth injuries may be further damaged by forcefully pushing downward on a boggy puerperal uterus. Certain degrees of procidentia and uterine displacements may be produced that are seen at a later examination. The writer has seen the anterior lip of the cervix fully outside the vulva during forceful manipulation to deliver the placenta. Infection here, likewise, is more to be expected for it is no difficult matter to have infected materials so common around the rectum following the termination of the second stage, contaminate the external os if it is pushed completely outside the vaginal tract.

After the expulsion of the placenta and membrances it is to be emphasized that a careful examination should be made to be sure no cotyledon is left behind. There is a great source of satisfaction in knowing if sepsis develops that no placental tissue remains in the uterine cavity. Following the termination of the third stage certain precautions are to be taken to combat hemorrhage. C. Moir[7] has reported the chief use of ergo-metrine is in the treatment and prevention of post partum hemorrhage. This drug, however, lends itself most beautifully at the termination of the third stage. After oral administration the response appears in about seven and one-half minutes, after intramuscular injection the effect is noted in three and one-half minutes and after intravenous injection in about forty-five seconds. Its effect lasts for as long as three to four hours. This drug is marketed under several names but it is the pure alkaloid of ergot (ergonovine). The advantages of ergonovine over pituitrin is, first, the longer lasting effect and its relative freedom from reactions. Pastore[8] noted five reactions and one death from intravenous pituitrin in 96 cases. Severe reactions from pituitrin have been experienced by the writer in both gynecology and obstetrics. A physician's wife was given pituitrin following delivery and developed a most profound anaphylactic shock. Moir[9] also reports that pituitrin may have a constrictor action on the coronary vessels of the heart resulting in depression. Ergonovine on the other hand has no influence on the cardiovascular system and has been given in full doses (1 mg. by mouth, 0.5 mgs. by injection) to patients in severe shock. It is therefore recommended that the new ergot alkaloid be given following the termination of the third stage of labor.

The management of the retained placenta needs only to be reviewed. After a period of time has elapsed, set arbitrarily in individual clinics or hemorrhage exists to alarming stages, manual removal is instituted. Considerable risk is carried with the procedure as is well known. Kraistensen collected the cases of intrauterine manipulation in the Maternity of Copenhagen State Hospital from 1924 to 1933 and found that among 16,137 labor cases the uterus was invaded 208 times. He concludes that the intrauterine manipulations were dangerous only in patients that were infected or markedly anemic. Given such a case we desire to have a complet change of gowns and gloves for the operator and a complete change of sterile sheets and drapes for the patient; patient completely anesthetized, catheterized and carefully cleansed externally. Baer[11] describes a method of keeping the hand within the membranes by following the cord to the fetal surface of the placenta, then invaginating a fold of membrane in advance of the hand and gradually peeling the placenta away from the uterine wall. If this is possible the removal may be accomplished without the hand coming in contact with the uterine cavity and therefore reduces the infection possibility. The following case deserves consideration:

A Mrs. K., aged 17 years, primipara, white, married, entered the hospital on August 25, 1933, with a retained placenta, having been delivered on August 24, 1933, at 6 P. M., of an eight-pound female child, in a nearby town by a fellow physician. The prenatal period was quite normal as was her labor and delivery. Following the birth of the child the physician administered, hypodermically, one ampoule of a thymus pituitary extract; after a conservative period of time, attempts to express the placenta met with no success so the cord was tied close to the vulva and cut. The patient was seen again in four, and fourteen hours later but still the placenta could not be expressed. The patient was then transferred to the hospital. There was, on physical examination, the following pertinent findings: Uterus, firm, round, symmetrical, about 2 cm. below the umbilicus, usual post partum edema of vulva, minor laceration of perineum, slight lochial discharge. Blood analysis revealed on August 25, 1933: Hb. 60%; R.B.C. 3,250,000; W.B.C. 17,900; urinalysis essentially negative. It was deemed advisable, in the absence of hemorrhage, to maintain a conservative plan of treatment and unless the placenta was adherent (placenta accreta) we felt that it would be expelled in due time. This did not occur. The hemoglobin August 31, six days following delivery, had dropped to 52% and the red count to 2,910,000. The pulse and temperature had ranged about 100 respectively but the temperature suddenly rose to 104° F. on September 1,

1933, and pulse 140 followed by a hard chill. A 500 c.c. blood transfusion was given by the direct method; the operating room prepared for vaginal examination, manual removal if possible, or abdominal section, supravaginal hysterectomy, if a placenta accreta was found. Under ether anesthetic the placenta was removed quite easily after difficult manual dilatation of the cervix. The uterus was not packed, no hemorrhage being encountered. The patient went on to an uneventful recovery and was discharged on Sept. 6, 1933.

The delay in evacuating the uterus was carried out first because we felt that the case would terminate spontaneously and that no harm was being done in waiting. The only change noted was the progressive anemia. Secondly the patient had a few days to build up some resistance from a bateriological viewpoint against possible infection she might have harbored in the birth canal or had introduced at the time of delivery (Taussig).[12]

Hemorrhage following the delivery of the placenta does not properly come within the management of the third stage of labor. However the principal reason for teaching gentleness in the management of the third stage is to prevent hemorrhage and the unnecessary loss of blood, therefore it seems reasonable to describe the management of so closely an allied problem and some causes. It has been the writer's practice to have the husbands of all patients under his prenatal care to be matched and typed early in the pregnancy. If the husband is found to be a suitable donor by this examination I feel that the most powerful weapon in combating hemorrhage is within my reach. Professional donors are not always available on short notice. If confronted with a post partum hemorrhage the placenta is removed manually if necessary; the uterus is packed tightly with several yards of sterile gauze; intravenous ergonovine should be given and a blood transfusion is done, giving what may be considered for her an adequate amount. The citrated blood method is simple, easy to do technically and safe. The Scanell direct method is my method of choice if time is not a factor and the patient can be taken to the operating room. Much interesting work is now being conducted on the use of moccasin snake venom in connection with obstetrical bleeding. A woman with a history of bleeding or severe anemia, with previous pregnancies, would justify the use, or at least the consideration, of such venom. It has been shown to be free from action on the baby and has no deleterious effects on the mother. The use of the snake venom should be given a trial in post partum hemorrhages even though its effects may be delayed.[13] There has been no experience with such material by the writer.

The blood loss in the third stage of labor from atony of the uterus, a condition met not infrequently when large doses of barbiturates are used, may be controlled by the prompt injection of pituitrin intravenously. Pastore[14] reports 1½ minims of surgical pituitrin diluted in 2.5 c.c. normal saline and injected slowly in the median cubital vein produces a specific response. However the drug is not without danger as has been stated above and should be used only in uterine atony. Cervical lacerations should be sought and dealt with accordingly.

Owing to the previous over-distension of the uterus in twin pregnancies or hydramnios, third stage often will be complicated. Hemorrhage is the most common danger from such a uterus that fails to contract satisfactorily. With such a tendency to an excessive loss of blood the placenta or placentate should be removed manually, the uterus packed and ergonovine given intravenously if the indications are urgent.

The third stage of labor in Cesarian section is treated by two methods: The placenta is given sufficient time to separate and the membranes then carefully wiped off the uterine wall or it is manually removed promptly following the delivery of the baby. Pituitrin is usually injected directly into the uterine muscle or intravenously as described above. Adair[15] reported the use of ergotrates (Lilly's) in the third stage, 0.25 mg. of ergotrate being given intravenously as the baby was delivered through the uterine incision. In all of the cases the uterine muscle contracted firmly, the uterine wall became blanched, and its contractions drew the peritoneum into small folds spread over the surface of the uterus. These changes were evidence of the marked tetany and contractility of the uterus. The point in the management is whether or not to leave a gauze pack in the uterus. Many authorities leave such a pack in the uterus with a bobin attachment for removal vaginally later in every case, which seems unnecessary unless severe bleeding is taking place. The same indication seems to hold in Cesarian section in regard to leaving in a pack as it does in the vaginal delivery, that is, hemorrhage that is not being controlled.

In Placenta abruptio the third stage may give

rise to much troublesome bleeding which cannot be controlled by uterine packing. In such cases the uterus may be so paralyzed from blood being shot between the muscle fibers that contraction is impossibly (Couvelaire uterus). Supravaginal hysterectomy is the treatment of choice and should not be delayed.

The problem of management of the placenta in abdominal pregnancy offers considerable perplexity. In one case seen at full term done by Cornell at Chicago Lying-In Hospital the cord was ligated as near the fetal surface of the placenta as possible and the abdomen closed without drainage. The patient was discharged following her convalescence of two weeks in the hospital but returned with a large abscess later on which drained for several weeks but finally went on to complete recovery. It is often impossible to remove any of the placental tissue due to its dense adherence to the abdominal viscera. The opinion of most authorities is to deal with this rarity with great caution, to remove the fetus and avoid the placental structures as much as possible. Fatal hemorrhage may be encountered at this stage. The closure of the abdomen, leaving the placenta in situ, without drainage seems to be the method of choice. A case reported at the St. Louis Gynecological Society in February, 1937, of abdominal pregnancy in which marsupialization of the sac and packing allowed the placent to come away piecemeal. The case reported died early in the postoperative days. Such management prolongs convalescence and gives rise to many complications.

SUMMARY:

1. The third stage of labor has been reviewed and discussed with special emphasis placed upon the use of pituitrin and the new alkaloid of ergot.

2. With the increased use of the analgesic drugs more relaxation and more post partum hemorrhages are observed.

3. A case of retained placenta after full term delivery is reported.

4. The method of management, recognized by most authorities, of several pathological conditions in connection with the third stage of labor have been presented.

106 N. Vermilion St.

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DISCUSSION

Dr. Chester C. Doherty, Chicago: I think Dr. Williamson voices the opinion of all of us in the management of the third stage of labor. It should be conservative. We are all familiar with the signs of separation of the placenta but we are not patient enough in many instances to wait for these signs to occur. Probably the chief cause of pathology in the third stage of labor is the attendant himself who tries to deliver the placenta before it has separated from the uterine wall. Dr. Joseph Baer of Michael Reese Hospital, Chicago, has described, practiced and taught for many years a method which requires no manipulation of the uterus, by simply waiting for signs of separation of the placenta and then grasping the abdominal wall with your hands, holding the recti muscles together to give the patient some support and having her bear down at the same time; the placenta will be delivered without any pressure on the uterus.

I would like to add two other etiological factors in the pathology of the third stage of labor. The first is delay, after giving pituitrin, in delivering the placenta after separation has occurred. I recently saw a patient in whom there was delay. All signs of separation had occurred. Vaginal examination revealed a fold of placenta lying in the lower uterine segment, with the contractile portion of the uterus at the site of the internal os so tightly contracted around the placenta that it was impossible to draw the placenta through it. We were interested in resuscitating the baby and forgot the mother. Fifteen minims of adrenalin relaxed that ring right under my hands, and manual removal was accomplished.

The other etiological factor is anomalies of the uterus. We are very apt to have delays in the third stage of labor in bicornate uterus. Both of these conditions will require manual interference.

Dr. Holland Williamson, Danville (closing): I wish to add only one point. In the Baer maneuver with which I am quite familiar, grasping the two recti muscles and asking the patient to bear down requires that the patient be totally awake and have control of all her faculties. However, most of my patients are quite asleep and I cannot get them to cooperate at all in the third stage of labor.

I fear some apology should be made for some of the threadbare statements I have made in the paper.

REPORT OF THE MATERNAL WELFARE COMMITTEE

F. H. Falls, M.S., M.D.
Professor of Obstetrics & Gynecology,
University of Illinois College of Medicine
Chairman of Advisory Committee,
Illinois State Board of Health
CHICAGO

The Illinois Department of Public Health in connection with the Educational Committee of the Illinois State Medical Society, and with the advice of the American Committee on Maternal Welfare have formulated a plan that can best be visualized by consulting the exhibit which appears in the scientific exhibits section at this meeting. Some uncertainty may be present in the minds of the members of this society as to the organization of this program; what are its purposes and who are behind the proposition. The steps in the development of the program are as follows:

After the passage of the Wagner Social Securities Bill, the State Department of Public Health was asked by the Childrens' Bureau to supervise the program in each state. Every state in the Union agreed to promote such a plan. The Director of the State Department of Public Health of Illinois asked me to suggest a plan for such educational program to present to the legislature. The plan was formulated, presented and met with approval. The governor appointed an Advisory Committee to the Director of the State Department of Public Health. On this committee with Dr. Falls are Dr. Jirka and Dr. Wightman of the Department of Public Health, Doctors Grulee, Hess and Crawford representing the pediatricians, and Dr. Ferguson, Chairman of the Educational Committee of the Illinois State Medical Society, together with representatives from several interested lay organizations, such as the Federated Women's Clubs, Parent Teachers, Farm Bureau, and State Nursing Association.

It was decided to present courses in obstetrics and pediatrics in various counties of the state, but before doing so the approval of the Council of the Illinois State Medical Society was sought, a plan was presented to the Council by the Chairman of the Advisory Committee on January 3, 1937, and accepted.

Dr. H. H. Hill, of the Department of Obstetrics, University of Illinois, College of Medicine, was appointed to the position of Field Consultant in Maternal and Child Hygiene, and was authorized to consult the secretaries of the various county medical societies where it was proposed to give courses, regarding the scope and character of the programs. A sub-committee of the American Committee on Maternal Welfare, consisting of Dr. Adair of the University of Chicago, Dr. Danforth of Northwestern University and Dr. Falls of the University of Illinois, suggested certain subjects for discussion and outlined lectures on these subjects to be used as a guide by the speakers who were to give talks at the County Medical Society meetings.

The lantern slide collections of the various Medical Schools were canvassed and duplicates made of those slides that were useful for illustrating the proposed lectures. The heads of the Departments of Obstetrics and Gynecology of the Chicago Medical Schools were asked to supply a list of the members of their staffs who could and would undertake to give these lectures. The Illinois Academy of Pediatrics also agreed to furnish speakers. It was necessary to get these programs under way by February 1 in order to complete the courses by the middle of May so that the results of the courses might be discussed at this annual meeting of the Illinois State Medical Society. This would assist in formulating plans for future courses. In order to familiarize the doctors of the state attending this meeting with the program and how it is organized, an exhibit was prepared which is on display in the scientific exhibits now. Space has been secured at the American Medical Association meeting at Atlantic City, where the exhibit which we have prepared for this meeting will be on display. This will invite comparison of the Illinois State plan with those planned for other states. Dr. Hill and the writer will be with the exhibit and discuss other state plans with a view to improve our own program.

A small post graduate course for licensed physicians consisting of one week of intensive work in obstetrics and pediatrics to be given at the College of Medicine, University of Illinois, will be offered. This course will be repeated every week for eight weeks and will be limited to ten men in each course. A registration fee of

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ten dollars will be the only fee in connection with the course.

A campaign of lay education is to be undertaken, working in cooperation with the Educational Committee of the State Medical Society, and through the representatives of the following organizations: Illinois Congress of Parent and Teachers Association, Illinois Federation of Women's Clubs, Illinois State Nurses Association, and the Home Extension Service of the University of Illinois. A plan for postgraduate instruction for nurses including lectures and demonstration courses will be provided. It is hoped in this way the laity will be brought to an appreciation of the services of the physician in connection with maternity cases that the work may become more dignified and better paid.

There should be a State Committee of the Illinois State Medical Society on maternal and child welfare. There should then be appointed a subcommittee in all of the larger counties, or covering two or three counties. These committees should study the obstetric and pediatric needs of the various counties, and make recommendations as to what action might best be taken to improve obstetrical standards in that community. There should be an annual joint meeting of these maternal and child welfare committees in connection with the state meeting to consider problems of mutual interest.

It is hoped that this program can be carried out in 1937-38 with the fullest cooperation of all of the groups interested.

PROBLEMS OF A HEALTH OFFICER IN A TOWN OF 40,000 PEOPLE

H. O. COLLINS, M.D.
Public Health Officer
QUINCY, ILLINOIS

Prior to 1920 the Board of Health consisted of the mayor, two aldermen and two physicians appointed by the mayor. Preceding this Board, the mayor appointed a Board consisting of the chief of police, two aldermen and two physicians. Prior to that time the Board consisted of three aldermen appointed by the mayor.

The secretary of the Board was the clerk of the police department, and the mayor each year appointed a sanitary officer who often had no knowledge whatever of public health work.

In those years there were frequent epidemics of communicable diseases and in one year there were as many as 340 cases of smallpox and 97 cases of typhoid fever, that being the year 1902. There were 34 cases of smallpox and 18 of typhoid fever in 1903; 86 cases of smallpox and 25 cases of typhoid fever in 1905; 215 cases of smallpox and 18 cases of typhoid and 91 cases of diphtheria in the year ending 1918; and 82 cases of smallpox, 14 cases of typhoid and 40 cases of diphtheria in 1919.

Repeated requests from citizens to the City Council for larger appropriations and a more up-to-date health department always received little or no support. The Rotary Club and citizens generally became alarmed and there was much criticism of the failure of the City Council to view the conservation of the public health as a matter of greatest importance and in need of far more attention than had been accorded it in the past.

At a meeting of the City Council, which in Quincy's case also acts as the Town Board—City and Town being co-extensive—Alderman Perry Ellis introduced the following preamble and resolution:

WHEREAS, There has been some criticism in certain quarters relative to the fact that a larger appropriation for health purposes was not made; therefore,

Be it Resolved, That the public attention be called in ample time to the fact that under an enactment of the General Assembly cities and townships can be organized as Health Districts and a tax for health purposes may be imposed up to the amount of four mills by submitting the question on petition to the vote of the people which can be readily done, and decided by the people prior to the making up of the next budget.

This resolution was adopted by a vote of 13 to 1.

The public promptly followed the advice given in the resolution and shortly after funds were raised by public subscription and petitions were circulated by many citizens.

The petition was filed with the City Clerk and Ex-Officio Town Clerk and the proposition placed upon the ballot, and at the town election held April 6, 1920, the proposition to erect the Town

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Read before Section on Public Health and Hygiene, Illinois State Medical Society, at Peoria, May 19, 1937.

of Quincy into a Health District carried by a majority of 41 votes.

The first Board, consisting of the Supervisor-at-Large, Assessor and Town Clerk, was promptly organized and the district was given the corporate name of the Quincy Public Health District of the Town of Quincy.

The Public Health Department was organized in 1920 and, to avoid a duplication of activities because of the term of the old Board of Health not expiring until the Spring of 1921, the new Health Department then took full charge of the conservation of health in the City of Quincy. A physician was appointed public health officer at $4,500 a year and he selected his staff.

The powers and duties of public health officers are as follows:

1. To be the executive officer of the board of health;

2. To enforce and observe the rules, regulations and orders of the State Department of Public Health and all state laws pertaining to the preservation of the health of the people within the public health district;

3. To exercise the rights, powers and duties of all township boards of health and county boards of health within the public health district;

4. To execute and enforce, within the public health district, all city, village and incorporated town ordinances relating to nuisances, public health and sanitation;

5. To investigate the existence of any contagious or infectious disease within the public health district and to adopt measures, with the approval of the State Department of Public Health, to arrest the progress of the same;

6. To make all necessary sanitary and health investigations and inspections within the public health district;

7. To establish a free dental clinic for the benefit of the school children of the district;

8. To give professional advice and information to all city, village, incorporated town and school authorities within the public health district in all matters pertaining to sanitation and public health;

9. To devote his entire time to his official duties.

The public health officer also acts as registrar for the District on appointment by the State Health Director, and is allowed such deputies as needed.

As the old Board of Health continued to function until the Spring of 1921, the new Health Department did not begin its activities until that time. Since a levy of one mill tax was made when they organized in 1920, the new Health District had about $28,000 on hand when they were ready to take over the job. This was a fortunate thing for them, as they were able to secure office rooms in the Majestic Building, where they have been up to the present date. They were also able to secure office equipment, pay all bills for the year as due and a neat balance was left for any emergency.

The first Public Health Officer appointed by the Board was Dr. John W. H. Pollard (now of Evanston, Illinois), and much credit is due him for getting the department off on the right foot.

Among the powers and duties of boards of health under this act is to appoint, upon the advice of the public health officer, such nurses, chemists, experts, clerks and assistants as the public health officer may deem necessary; to establish, equip and maintain suitable offices, facilities and appliances for the health officer and his assistants; to pay from the "public health fund" the salary of the public health officer and the salaries of his appointees and employees and all other expenses pertaining to the department, including therein the expense of administering the sanitation and health laws and ordinances.

Under this act our board of health is annually required, before the first day of August of each year, to transmit to the County Clerk a certificate signed by the Chairman and Treasurer, setting forth the rate or percentage of such taxes by them, levied for the purposes herein provided and it shall be, and is made the duty of the County Clerk to whom such certificate shall be transmitted, to set down in the general tax warrant of the year for the collection of state and county taxes, in a separate column to be styled a "public health tax." Our board of health, as required by this act, holds an annual meeting on the second Tuesday in April of each year, at which meeting officers are elected for the ensuing year. They are also required to hold meetings quarterly on the second Tuesday of January, April, July and October. On the first Friday of each month, the board meets to pay salaries and

bills. Special meetings can be held at any time upon written request signed by two members and filed with the Secretary.

Almost immediately after the new health department got under way, the health officer succeeded in securing a complete equipment from the State Health Department for a venereal clinic. The State also allowed $100 per month to a local physician to treat such cases as were sent to the clinic. This continued during the time Dr. Pollard served as health officers. After four years here, the doctor resigned to accept another appointment at Evanston, Illinois.

The next health officer was a sanitary engineer, but, as he was not a physician, he failed to make a success of the venture. One of his first acts was to abolish the venereal clinic. This raised a storm of protest from the public in general. He was not at all satisfactory to the physicians here. They demanded that a physician be appointed who could see their side of the case as well as the public's. He remained about ten months.

Dr. Rhodes, from somewhere in Tennessee, was next appointed. He remained five years. During his term here there was such strong pressure brought on the Board by business men, union labor circles and others to reopen the venereal clinic that the Board again took the matter up with the State Health Department for a return of the venereal equipment used before. The State Department refused, stating that they had furnished the equipment once and they could see no good reason for again returning the outfit and perhaps in a short time have it sent back.

The Board then decided to purchase their own equipment and it was with the understanding that the health officer would take charge of the clinic that this was done. Only indigents, cases from the county jail, house of correction, police department and cases referred by local physicians of our City are taken care of by the clinic. Tuesday and Friday afternoons are set aside by the health officer for such cases. We are at the present time treating from 75 to 80 cases per week.

I was appointed health officer in 1931 and since that time there has been a gradual increase in venereal cases. I presume this has been due to the depression, when the patients who formerly could pay for treatment were unable to do so and, as a last resort, came to us. As conditions in general are improving, I think I can see a gradual decline in the number of cases calling on us for treatment. Our annual report for the year ending April 1, 1937, shows 253 individuals made 3,911 visits to our clinic for treatments, examinations, Wassermanns and smears.

Dental Clinic Division: When this division was first instituted, a few dentists of our City volunteered their services and would work certain hours each weekday; however, this did not prove satisfactory. We now employ a dentist (Dr. L. P. Spann) for part time. He works in the dental clinic each weekday from 8:30 A.M. to 12:00 noon. Only school children are entitled to the benefits of this clinic, which is free to all children attending school in this health district. During the year ending April 1, 1937, 1,333 individual children made 4,176 calls for examination, dental operation or advice.

Our Nursing Problem: For many years there has been an institution known as "Cheerful Home" which is kept up by donations from private sources. They have public health nurses on their staff. Of course, they make house to house visits as needed, and one nurse is connected with some large insurance company. Now, of course, these nurses are doing a great deal of good, but they do not fit so well in our program.

The schools of Quincy want nurses, but say they cannot pay for them. We have wanted public health nurses ever since I assumed the duties of public health officer. For various reasons we have never been able to get nurses until this year.

The Board of Health has endorsed my recommendations for three certified public health nurses and the State Department has offered us the services of a public health nurse for a period of eight to twelve months to act as supervising nurse. The program is to be one of school and generalized nursing. With the aid of these nurses we hope to get not only school children, but pre-school children as well, vaccinated for smallpox, immunized against diphtheria, etc. Much of their work will be educational in character. They will report for duty about August 15, 1937, and have a program planned by the time school opens in September.

Our present personnel consists of the following: Public health officer and registrar, deputy registrar and secretary, sanitary officer, sanitary inspector, director dental clinic (part time), district bacteriologist (part time), and clinical as-

sistant. To this list we can now add three public health nurses.

Now, in regard to our tax levy we have been very fortunate. We have only been required to levy a one mill tax on two or three occasions when we had some extra expense to meet. One-half mill or five cents on the hundred dollar's valuation has been the usual levy.

Three years ago we had accumulated enough surplus that we were able to skip a levy for one year. Of course, with the three nurses added to our personnel we will be required to levy a one mill tax in the future. This is only 10 cents on the one hundred dollar's valuation.

In my opinion, the advantages of this health district are as follows:

1. The tax for operation of the health district is so small that it is not a burden to the taxpayer.

2. It gives sufficient funds to have a health district satisfactory to all. I do not believe our people would ever think of going back to the old way.

3. It is practically out of politics.

My relation with the Board has always been most congenial. Any matters referred to them are promptly turned over to me for settlement.

Having practiced medicine here for many years before taking over the duties of health officer, I am familiar with the doctor's as well as the health officer's side of questions coming up and, consequently, I receive full cooperation of our physicians at all times.

It is my constant endeavor to follow to the letter all instructions sent out by the State Department of public Health.

In closing, I might state that, while the result of the vote for this health district only carried by 41 votes, I feel sure if an election were held now it would carry by several thousand.

DISCUSSION

Dr. Warren F. Pearce, Quincy: I shall make my remarks from the standpoint of a practicing physician rather than that of a health officer. Dr. Collins brought out the fact that when the Quincy Health District was formed, the election was carried by only forty-one votes. However, I am sure that if the question were to be voted upon now the result would be almost unanimously affirmative. I feel equally certain that I express the sentiments of the physicians of Quincy when I say that we are exceedingly pleased with the new arrangement. Prior to the establishment of the health district, we had a so-called board of health but really this board was, in no sense of the word, a health department. We now have a well functioning department of health and we, as physicians, are very happy that the change was made. The fact that our health officer, Dr. Collins, is a former practicing physician and has the ability to look at questions from the physician's viewpoint, as well as that of a health officer, is of no little help in maintaining the pleasant relations which exist.

It would probably be desirable to have even a slightly higher tax in order to provide statistical data of value and broaden the scope of the work done by the department.

The employment of nurses will prove to be of much value in the prevention of communicable diseases, especially in the field of case finding.

The venereal disease clinic has been of great value to the community in that many cases have been treated which would otherwise have been neglected. The clinic has also been of value to the physician because it has relieved him from the care of venereal patients that were unable to pay for medical services. Undoubtedly, the adequate treatment of these patients has lessened the dissemination of infection.

Without question the establishment of the Quincy Public Health District has been of great value and I can think of no reason why other similar cities would not establish such a plan.

ENDOMETRIOSIS

FRED O. PRIEST, M.D.
CHICAGO

Definition. The lining of the uterus is composed of a sheet of embryonic connective tissue containing many simple tubular glands lined with a characteristic columnar epithelium. This lining, called endometrium, undergoes definite cyclic changes during the entire reproductive period. Ectopic islands of tissue similar in structure to endometrium and responding to the same stimuli are spoken of as endometriosis. These aberrant growths have been described on all important structures lying between the umbilicus and the vulva. A varied nomenclature has arisen because of the wide distribution of these lesions. Endometriosis is a general descriptive term suggested by Sampson to describe the gross appearance or location of an individual lesion. Unfortunately the nomenclature of some of the most common lesions has become complicated by individual writers applying their own descriptive terms to previously described lesions. As an example, let us take the terms "chocolate

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cyst of the ovary," "Sampson cysts," "perforating cysts of Sampson," and "endometriuma of the ovary." All of these are used to describe the same growth.

History. In the middle of the nineteenth century Rokitansky reported these adenomatous growths and in 1861 he described the invasion of the uterine wall by endometrial-like glands, thinking it on an inflammatory basis. Von Recklinghausen, in 1896, gave us the most valuable early description. He demonstrated ciliated cylindrical epithelium in one of the growths. Cullen in 1896 described the first adenoma outside the uterus, an adenoma of the round ligament, and soon afterwards described a diffuse invasion of the uterine wall (adenomyosis). Since 1918 Sampson has written much on this subject, suggesting the term "endometriosis", and offering the theory of origin from mature uterine or tubal mucosa. His original contributions have stimulated much interest and many case reports have followed.

Etiology. No one theory is universally accepted as the etiological factor of endometriosis.

1. *Theory of embryonic rests.* Since the epithelia of the genitalia and the peritoneum arise from the celomic mesothelium, it is reasonable to believe that misplaced rests might later, under proper stimulation, give rise to ectopic growths. Because of the proximity of the Müllerian tract and Wolffian body during embryonic development, one can readily see how anomalies might appear in the final structures into which the tracts develop. This theory does not explain endometrial-like growths in the bowel, about the umbilicus or in postoperative scars after the uterine cavity has been opened.

2. *Theory of Invasion.* Cullen conclusively proved that the mucosa lining the uterine cavity may invade the uterine musculature. By serial section he was able to trace the connection between glands deep in the myometrium and this lining of the uterus. This benign invasion may be compared with that of adenocarcinoma of the corpus. Anything disturbing the equilibrium between the endometrium and myometrium might stimulate such an invasion. Much earlier Chiari pointed out this invasion of the horn of the uterus by the tubal epithelium with node formation. He thought the inciting factor of the invasion to be inflammation, but this is not generally accepted.

3. *Theory of Implantation.* The menstrual debris has been proved to contain living epithelial cells and stroma. These have been kept alive experimentally both in culture media and by transplanting them into various organs of the host. This experimentally produced endometriosis responds to estrus, pregnancy and to hormone injection just as does the endometrium within the corpus, and as do adenomyomata that have developed spontaneously. Sampson pointed out that endometrial debris may be found in tube lumina and that patients operated upon during or just after the period often have blood at the fimbriated end of the tubes and in the posterior cul-de-sac. Especially is this true with retroversio uteri. He coined the term "endometriosis" and suggested this retrograde menstruation as the etiology of growths within the peritoneal cavity. Later he has included transplantation of endometrium during surgical operation where the uterine cavity is opened.

4. *Theory of Metastatic Development.* Viable bits of endometrium have been found in the veins of uteri removed during menstruation. Undoubtedly the uterine veins are dilated and opened up during gestation and during surgery. The question then comes up, Why the peculiar sites of metastases, if this be an etiological factor?

Frequency. Endometriosis occurs in women during menstrual life. A few cases are reported after the climacteric but they undoubtedly developed earlier and were discovered incidentally at that time, or where the growth is extensive, may produce their first symptoms, as obstruction when retrogression begins. A few cases are reported under twenty years of age. The majority, however, occur between thirty and forty years of age. The reports of incidence vary greatly, being naturally higher from the gynecologists than from the general surgeons because the former search more diligently for the evidence of endometriosis. Many small lesions are often overlooked. Sampson's estimate that 10 to 20% of women having laparotomies for pelvic disease have some evidence of emdometriosis we believe to be conservative.

Sites of Growths. Some authors choose to divide the condition into internal and external

endometriosis. The former includes the subbasal growths just beneath the endometrium, diffuse involvement of the myometrium, discrete localized adenomata within the wall, and the "isthmic nodes" about the interstitial portion of the tubes. External growths refer to growths within the tube, surface implants on the ovary, chocolate cysts of the ovary, peritoneal involvement below the umbilicus (appendix, bowel, ureter and bladder), adenomyoma of the uterine ligaments, rectovaginal septum, or within abdominal scars.

Symptomatology. Because of the combination of lesions possible in this condition, the symptoms must of necessity vary much, depending upon their location and extent. It is of interest to note that rather extensive involvement may at times produce few if any symptoms, while again relatively small lesions may produce symptoms suggesting an acute abdominal crisis.

The symptoms most commonly encountered are: first, pain; second, irregular bleeding; third, dyspareunia; fourth, backache, and fifth, disturbance of bowel or bladder function.

Analyzing the symptom of *pain* in endometriosis we find that its character depends not only upon the location of the lesion but that it varies with the cyclic changes taking place in this displaced endometrial-like tissue. The most characteristic general type of pain is that of an acquired dysmenorrhea which appears at the time of premenstural congestion, reaches its height with the onset of the flow, then gradually diminishes as congestion recedes. This discomfort is of a dull aching type often described as that of fullness or distention and is frequently not relieved by the usual remedies used for dysmenorrhea. Since these lesions occur most commonly in the dependent portions of the pelvis, *backache* is a frequent form of discomfort. The resultant congestion and tissue reaction of surrounding structures are probably responsible for that pain which often radiates down the thighs simulating sciatica. In like manner, involvement of the anterior rectal wall or the rectovaginal septum produces discomfort when the rectum is distended either by gas or fecal material. Less frequently is the peritoneum over the bladder involved with its consequent urinary disturbance. One of the most distressing forms of pain is that of dyspareunia occurring when the rectovaginal space, posterior fornix or sacrouterine ligaments are involved.

Menstrual irregularity is a common accompaniment of this condition. This irregularity may take the form of polyhypermenorrhea, oligomenorrhea, metrorrhagia or relative amenorrhea. When increased blood loss occurs it is often out of proportion to the extent of the lesion. This increased blood loss is at times explainable by co-existing pathology, such as fibromyomata but often must be explained, we feel, on a hormonal basis.

Diagnosis. The diagnosis of endometriosis can usually be made by a painstaking analysis of the onset and course of the pain and menstrual irregularity plus a careful abdomino-rectovaginal examination of the pelvis. At times a probable diagnosis is arrived at on history alone in the absence of palpatory findings. More frequently, however, one or more of the following findings aid us in establishing a diagnosis. First a nodulation, beading or puckering of one or both sacro uterine ligaments. This puckering often involves the posterior fornix or the rectovaginal space. Less frequently the diagnosis is established by seeing blue domed cysts in this puckered area of the vagina. These lesions, because of their perforating and adhesive properties, often fix the uterus in retroversion. Moderate enlargement of one or both ovaries with fixation presenting the above history suggests endometrial involvement. Uniform enlargement of the uterus, particularly when associated with a sudden gushing type of bleeding or undue premenstrual tenderness, suggests adenomyosis. Vicarious bleeding coincident with the menstrual period from any of the hollow organs of the pelvis, or abdominal scars, or sinuses in the abdominal wall is pathognomonic of ectopic endometrial tissue.

When a pre-operative diagnosis has not been made and symptoms are absent, the finding within the pelvis of these plum colored lesions with puckering of the surrounding peritoneum warrants a gross diagnosis. Cutting into these lesions often reveals chocolate to tarry colored fluid. Final diagnosis should not be made, however, until microscopic evidence is available.

Treatment. The treatment of endometriosis may be divided into surgical and irradiation. The choice of method is most important because these patients are, for the most part, in the child-

bearing age and preservation of function is of the utmost importance. Particularly is this true since relative sterility is a common accompaniment of this condition.

Because of the dense adhesions and perforative tendency of these lesions surgical treatment may become a very difficult and destructive procedure. This is especially true of the ovarian lesions and it is in these organs that we feel conservation is most essential. It is well known that casteration produces a cessation of symptoms and a regression of the lesion, but we think that this should be reserved for those few cases in which the lesions are so widespread or are so intimately connected with important organs that surgical resection is impossible or is deemed unwise. Conservatism is, of course, less important in women near the climacteric. If for any reason operative treatment is contraindicated and symptoms are sufficient to demand treatment, regression can be accomplished by castration irradiation, preferably by x-ray.

I shall point out the gross and microscopic pathology of the various lesions in discussing the lantern slides.

55 East Washington Street

DISCUSSION

Dr. George W. Stephenson, Bloomington: It seems to me that Dr. Priest has given us a clear and concise presentation of a subject which has interested physicians since abdominal and pelvic surgery became commonplace. In discussing his paper there are several points of especial interest which I should like to call to your attention.

While it makes little difference in the care of the patient, the large numbers of adherents to the various theories of the etiology of this condition are evidence of the absence of really conclusive proof as to its mode of origin. In addition to the three theories of embryonic rests, invasion and implantation, it is only fair, perhaps, to mention that the theory of serosal metaplasia has many adherents, particularly among the Germans. Inbrief, this theory claims that by some undetermined exciting factor the serosa of the pelvis undergoes a change from its rather low grade differentiation into highly differentiated epithelium, which then invades the underlying structures. This theory was strongly supported in this country by Dr. Novak as late as ten years ago. It might explain some of the tumors under discussion which are found in positions difficult to explain by the implantation theory of Sampson, such as those along the round ligament, in the vulva, and low down in the rectovaginal septum, but it has the disadvantage of not explaining why similar conditions are almost never found above the umbilicus.

There is no question but what the majority of men who see pelvic surgery frequently, cannot help but reason, as Sampson did, that these growths must usually be implanted on the peritoneum by way of the tube from the body of the uterus. This is further supported by the fact that in one of his papers Sampson reported 250 cases with patent tubes in 257 cases of peritoneal endometriosis, and that in those animals which do not menstruate there have been few cases found with similar tumors. The possibility of transplantation has been proved beyond question of a doubt by several individuals.

In discussing the diagnosis, Dr. Priest might have mentioned more fully the amazing number of adhesions which may be formed around these endometrial transplants, particularly when they occur in the ovary, so that at first glance the surgeon is hard put to it to decide as to whether he is dealing with endometriosis, a mass of inflammatory adhesions, or an ovarian carcinoma. The finding of bluish, tar-containing cysts will often clear up this matter at the table without waiting for a diagnosis of the tissue by the pathologist. It is my impression that except in those cases where cysts are seen protruding into the vagina, or into an abdominal scar or sinus, that the diagnosis is almost always made after the abdomen is opened.

The question of treatment has been well presented, the outstanding point being that conservatism is the keynote. This is true because these cysts are usually very slow growing, and while they are invasive, they probably do not become malignant, although coincident malignancy may occur in the same organ. I believe that if the condition is incidental, and the cysts are small, in a patient nearing the menopause, that a waiting attitude may be adopted. In the same patient if the cysts are of sufficient size to cause symptoms in themselves, particularly those of obstruction to the bowel, or partial occlusion of the vagina, and removal is formidable, certainly it would be justifiable to remove both ovaries, since these tumors definitely retrogress after the menopause, whether it be natural or artificial. In a young woman every attempt should be made to preserve ovarian function, unless the growth is causing severe symptoms and is in a place where its removal would require more extensive surgery than would seem justified.

Dr. Fred O. Priest, Chicago (closing): I intimated the inclusion and serosal theory of development in stating that the pelvic peritoneum and epithelium of the genitalia arise from the celomic mesothelium. Certainly no theory will explain all types of development. I must insist that endometriosis may be diagnosed without the presence of blue dome cysts in the vagina. I have seen these cysts only once and I have seen hundreds of cases of endometriosis. Certainly the diagnosis will be easier if one sees mucosal thickening and puckering. Very frequently there is thickening of the sacroiliac ligament. Recently I had a patient who came in with symptoms listed as if she were reading them out of a textbook. She had extensive involvement, excruciating pain when the rectum contained feces, pain on bowel movement, and pain on coitus.

MALARIA WITH SPECIAL REFERENCE TO NARCOTISM

ITALO F. VOLINI, M. D.
WILLIAM W. SHAPIRO, M.D.
CHICAGO

This report is prompted by three main reasons: the first purpose is to direct attention to the pronounced increase in malaria as indicated by the records of the Cook County Hospital, with especial reference to malaria in addicts. Secondly, it is the aim in this paper to discuss the clinical picture of malaria in addicts, pointing out the probable causes for the atypical manifestations which cause marked delay or even mistakes in diagnosis. Thirdly, negligence of continued treatment constitutes a menace as far as malaria spread is concerned, and the factors involved should be given more study with strict permanent supervision of malarial addicts.

Malaria is considered relatively uncommon in Chicago, being rarely seen in private practice. Yet at the Cook County Hospital, in one medical ward, we treat from ten to fifteen of these patients each year.

From January, 1925, to March, 1933, an eight year and two months period, there were 179 malarial admissions as reported by Eaton and Feinberg.[1] The statistics of these investigators reveal a number of interesting features: of the total number, 23 patients were narcotic addicts; or 12%; there were 22 men and one woman; three had been readmitted on two occasions. Only two of the narcotic addicts could have acquired their disease in the South; 112 of the non-addicts had given a pertinent history of being in the South; 38 of the non-addicts had never been South; and these acquired the disease only in the months of July to October, while the drug addicts acquired the disease at any time of the year. The prevalent organism in the entire group was the plasmodium vivax.

The report of Eaton and Feinberg was the first in this country describing a large series of malaria patients in which there was a great incidence of narcotic addiction. Geiger[2] treated six patients with tertian malaria, five of whom were morphine addicts. Four of these had tertian, and one, the quartan type of infection. Similar reports were made in this country by Nickum,[3] Applebaum and Gelfond[4], Helpern[5], Bradley[6, 7], Himmelsbach,[8] and Faget.[9] In Egypt, Biggam,[10] described ten heroin addicts who subsequently developed a malignant tertian malaria. A larger series of such patients was subsequently mentioned by Arafa.[11]

One hundred and twenty-four patients have been admitted to the County Hospital from March 14, 1935, to April 15, 1937. (Table I.) This is a large number by comparison with the series of Eaton and Feinberg, who mention 179 admissions in a period longer than eight years. Of the 124 patients, fourteen were children under fifteen, six boys and eight girls; of the 110 adults, 24 were women and 86 men. Several of the patients had been in the hospital more than once, making a total of 136 admissions. Thirty-two patients, 27 men and 5 women, were colored. The average ages ranged between twenty and thirty.

TABLE 1

Total No. of Admissions March 14, 1935 to April 15, 1937	136
Total No. of Patients from March 14, 1935 to April 15, 1937	124
No. of Men	86
No. of Women	24
No. of Children under 15	14
Total No. of Addicts—45; Men	38
Women	7
Addiction in Total Series	36%
Addiction in Total Adult Series	41%

Narcotic addiction was present in 45 patients, 41% of all the adults, and 36% of the entire group. The addicts numbered 83 men and seven women. Twenty-one of the colored people were addicts, and, as there were only thirty-two colored in the entire series it is evident why the presence of malaria in a colored adult makes us strongly suspicious of narcotism. (Table 2.)

TABLE 2

	Men	Women	Total
White	59	19	78
Non-Addicts	39	15	54
Addicts	20	4	24
Colored	27	5	32
Non-Addicts	9	2	11
Addicts	18	3	21

	Percentage Addiction
White	31%
Colored	65%

The source of the malaria in the colored who were not addicts could not be definitely determined.

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Read before Section on Medicine of Illinois State Medical Society, May 19, 1937, at Peoria.

The narcotic usually employed by our patients is heroin, which corresponds with the experience of others.[4, 10] Morphine is also frequently used. It is not uncommon for many of the patients to take more than one narcotic, many using three or four. Particularly is this true in the 'pleasure addicts' who may have sampled laudanum, cocaine, morphine or heroin. Twenty-nine of our patients used heroin alone; four used morphine and heroin, three used heroin and cocaine; nine used morphine alone. The diagnosis of narcotism in a few of the more severely ill was based upon the presence of thickened, sclerotic veins in the cubital region, with the numerous scars from needle punctures in the overlying skin.

In our entire series there were twenty-eight patients in whose blood the aestivo-autumnal parasite was positively demonstrated. Twenty-two of these twenty-eight were narcotic users, representing over 50% of the addicts. Two patients with aestivo-autumnal malaria were children who had acquired the disease in a children's camp at a nearby Wisconsin lake. Two patients, non-addicts, acquired aestivo-autumnal malaria while in the South. Two aestivo-autumnal sufferers entered the hospital in moribund condition, dying within twenty-four hours, so that no history was obtained. The series of Applebaum and Gelfon[4] were made up entirely of the aestivo-autumnal type. Eaton and Feinberg[1] do not mention the occurrence of austivo-autumnal fever. This form of malaria is considered essentially foreign to the Chicago region.

In the other patients, plasmodium vivax was demonstrated in thirty-two; in sixty-four the parasites were found but the type was either not mentioned or was not definitely determined.

A history of having been in the South was given by fifty-one patients. Four of the addicts had been South, but only one, apparently, could have acquired this illness in the course of his travels. A large number became ill after a visit in Southern Illinois, especially around the Springfield sector. Arkansas and Southern Missouri were other important sources. In the other patients, no history of travel was obtained. Malaria followed blood transfusion in one instance. Another patient had received malaria during treatment of general paresis. In twenty-four patients, the source of the infection remained undetermined.

The seasonal incidence of the disease in our group is very interesting. Fifteen patients were admitted in June; seventeen in July; thirteen in August, and thirteen in September, accounting for only 42% of the total number. Most of the patients were seen during the colder months of the year. There is an evident lack of relationship between seasonal incidence and onset of symptoms in the narcotic group.

The mortality in our entire series was nine per cent; no deaths occurred among the children; eight of the eleven deaths occurred in addicts, four of them were colored; eight of the patients who died were in the hospital twenty-four hours or less; two lived forty-eight hours; one patient lived four days; another five days. (Table 3).

TABLE 3 *Mortality Table*

Total Deaths.....11 or 9%

	Men	Women	Total
White	6	1	7
Non-Addicts	*3*	*0*	*3*
Addicts	3	1	4
Colored	3	1	4
Non-Addicts	0	0	0
Addicts	3	1	4

Percentage Death

	Whites	Colored	Total
Addicts	16%	20%	18%
Non-Addicts	5%	0	4%
Total Deaths	11	..	9%

These patients were all admitted to the hospital in very poor condition, and in only one instance might death have been avoided by more astute diagnosis. In the experience of most investigators,[5, 6, 10] the combination of narcotism and malaria is attended by a very high mortality. The improvement made by some of the patients, particularly a few of the narcotic habitues, was very surprising. Many developed typical cerebral malaria, yet responded brilliantly to ordinary quinine therapy. Their average stay in the hospital was between nine and ten days.

The onset of malaria in the addicts is in most instances directly referable to a specific injection of the offending narcotic, usually at a recent date. As a rule, there may be two or more patients in the hospital or in the same ward simultaneously, who were present at the same celebration where each received his plasmodia. These individuals are often well acquainted and identify one another very readily.

The narcotic addicts acquire malaria in a very interesting manner. They usually will readily convey whatever information is desired, espe-

cially when they have recently had their drugs. Most of them are very poor, and pool their meagre funds in an effort to obtain the drug, two or more individuals making up a party. Some of these parties may consist of as many as nine or ten people, usually men, but sometimes men and women. A patient with latent or active malaria will be present at one of the big parties and whosoever follows him in the order of injection will become ill.

The syringe effect is usually obtained with an ordinary medicine-dropper in this manner; a small piece of paper, or better still, a rubber-band, is fastened about the tip of the dropper, serving as a means of holding an ordinary Luer needle in place. Only the more affluent possess hypodermic syringes. The narcotic is dissolved in a minimum amount of water and is usually placed in an upturned metal bottlecap. Only occasionally a lighted match is applied underneath to produce a sterilizing effect. Sometimes the fluid is drawn into the dropper through a cotton filter, the needly is attached, and each guest then receives his portion—all using the same needle and dropper. Although the injection is often subcutaneous, many receive intravenous injections in the cubital fossa. Tourniquets are made with handkerchiefs, and the injections are made with great skill.

One of our patients who had been using different types of narcotics for the past five years stated that many of his conferees had acquired malaria. Another patient, a heroin addict for twenty years, had ten days previously exchanged syringes with a woman who had been very ill with fever for two weeks. The woman was brought to the hospital on the following day and died very shortly after admission. The mother of one boy said that her son had purchased 'ink' from three men who had died recently of malaria, and that two other customers of these men had also died recently. Descriptions such as the foregoing are very common.

Although transmission from an active patient is a certain method of acquiring the disease, we have noted that the possibility is not remote of acquiring it by the injection of blood from individuals who are not known to have malaria. In one of our patients, a child aged eleven, a blood transfusion was given following a severe trauma; her father was the donor. Shortly after the transfusion, the child developed a severe tertian malaria, and it was subsequently found that the father had had malaria twenty-five years previously in Asia Minor—his health having been perfectly good during the entire interval. The literature is replete with many similar references:[12, 13, 14, 15, 16, 17] Jankelson[18] mentions the development of malaria in a child given a transfusion from his father, the latter having contracted malaria forty years previously. In most of the instances the donors, either had long since forgotten about their previous illness, or, having been in malarial infection regions, never remembered being ill.

Variations from the ordinary clinical pictures of malaria are frequently noticed in narcotic addicts. These are due to a number of causes. First, atypical syndromes occur because of the frequency of the aestivo-autumnal type of infection. Second, addicts may give a history of four or five intravenous injections of the drug daily so that maturation of the plasmodia thus occurs at irregular intervals or continuously. This may probably also account for many of the serious cerebral forms of the disease. Third, the inadequacy of surgical sterilization tends to increase white blood counts, and a fourth cause is the too prevalent attitude which is encountered of administering aspirin or other antipyretics before diagnosis is made, thus altering the fever curve.

The incubation period of man-made malaria will often produce confusing pictures. Ordinarily, symptoms will appear within two weeks of injection. In a number of our patients the incubation period has appeared to be as long as six or eight weeks. In a few, the interval between the injection and the onset of symptoms was so great that a definite correlation of the two factors could not be readily established.

The diagnosis of malaria is often facilitated by the leucocyte counts which are usually seven thousand or less. Some counts, however, are unusually high,[5] and in malaria patients are often associated with pulmonary findings. Fifteen of our patients had leucocyte counts higher than 10,000, and in five patients they were 32,000, 18,000, 16,000, 23,000 and 20,000, respectively. In one patient, with a 23,000 white count, the peripheral blood did not seem to reveal presence of parasites and the leucocytosis was a stumbling

block in the diagnosis. This patient was studied carefully, but the scars she had in her cubital regions were overlooked, or, if noticed, were not properly evaluated as to their significance. A high leucocytosis seemed to tentatively rule out malaria. The anatomical diagnosis was: aestivo-autumnal malaria; sclerosed cubital veins probably due to frequent injections of narcotics.

One does not think of malaria as a disease common to this part of the country. Any patient, therefore, who presents the more unusual manifestations of a prolonged febrile disease may present a confusing problem in diagnosis. This is all the more evident when one realizes that the finding of the parasite in the blood stream is sometimes difficult. Few or no parasites may be present on any one slide. The preliminary blood examinations are made by internes, who, all too often, are not familar with the plasmodia forms.

The demonstration of parasites in the blood stream must be made in those patients who come under observation before a positive diagnosis of active malaria is made. Careful checks are made and invariably no treatment for the febrile condition is given, unless the patient is in extremis, until the diagnosis is definitely made. Where suspicion of malaria is aroused, adrenalin is sometimes given to produce an influx of parasites into the peripheral blood. In our experience, this procedure is seldom effective.

A history of recent or late drug addiction as well as the presence of suggestive pigmentation and scaring in the cubital regions have been helpful in making a diagnosis. The use of quinine in making the so-called therapeutic test for malaria does not meet with our approval, for quinine, while having an almost magic effect in controlling the fever in malaria, is an excellent antipyretic in non-specific fevers. A sudden reduction of temperature, particularly when the parasites have not been found, which frequently occurs after quinine administration, will often becloud the diagnosis.

The stay of malaria patients in the hospital averages between nine and ten days. In an institution like the Cook County Hospital, two factors may prompt a rapid discharge of these patients. First, the wards are often crowded and the bed space is badly needed, so that after a patient has been fever free four or five days, he no longer seems to belong in a hospital, is sent out, and usually receives no further treatment. Second, the patients who frequent our institution, either become restless and have the wanderlust, or, more important, they may have a craving for drugs, which are not furnished in the hospital. After the discharge of the patient, a designation of 'improved' is usually found on the charts. Sometimes the charts may read 'cured.' Improvemennt of the severe symptoms has unquestionably occurred. We take exception to the word 'cure'. A period of treatment in the hospital ranging from one to two weeks is insufficient to cure even a small percentage of patients, and those who are drug-addicts are released to prey on their brethern. Any uncured malaria patient may under suitable circumstances be a menace to his community. Parasites can be harbored by an individual who has never had symptoms of the disease. We have mentioned where apparently healthy people have transmitted malaria through transfusion, and their malarial history will date back five to forty years with no appearance of cachexia or intercurrent illness.

We contrast the two reports from this institution: 179 patients in eight years from 1925 to 1933; 124 patients in the two years 1935 and 1936. Thirteen per cent of all the malarial admissions in the eight years were in drug addicts. In the last two year period 41% of the adult malaria patients were drug addicts. What then, can be the explanation for this increase? Malaria certainly never was an uncommon disorder, and drug addiction has certainly always been prevalent. A possible relationship between these two disorders was unknown twenty years ago, and yet every year since 1925, malaria in drug addicts becomes more frequent.

Several factors are probably operative. Most important, addicts now take their drugs in groups instead of individually. The reasons for this being first, the gregarious habits of the younger age addict, especially male negroes; second, the difficulty in obtaining the drugs; and third, the high cost of the narcotic. Again, this increase is coincident with the introduction of the malaria parasite by Wagner-Javregg in 1918 as a form of therapy for syphilitic paresis. This manner of therapy has become increasingly common. It is usually given only in institutions for the mentally deranged, which hospitals usually

harbor many drug addicts. The cured paretic may subsequently consort with the drug addict, or the latter may acquire the disease with the mosquito as the intermediary.

Artifically induced malaria as a public health hazard is discussed by Shaughnessy.[19] He describes an epidemic, with twenty-five patients in all, related to a hospital for the insane. Six patients had received their malaria by inoculation; eleven inmates, uninoculated, acquired malaria; six employees and two persons residing outside, but near the institution, were likewise afflicted. Mosquitos were found breeding in the vicinity. There may have been failure to completely cure the injected patient, although the continuous passage of parasites through human hosts is believed to cause the disappearance of the gametocytes.

In our patients, the aestivo-autumnal fevers, however, were definitely acquired through the use of the hypodermic needle and the thoroughly differentially gametocyte can nearly always be demonstrated.

Summary. Malaria has increased in Chicago during recent years. Narcotic addiction associated with malaria has become quite common and is a serious public health problem. Malaria with addiction has been much more severe than malaria alone. The mortality in our malarial addicts was 18%. The association of the two disorders occurs most commonly in young people and heroin is the drug most often used. The aestivo-autumnal type of fever is not uncommon. The presence of malaria in two-thirds of our colored patients is associated with narcotism.

The parasite should always be found and identified if possible. A high leucocyte count should not be permitted to confuse the clinical picture.

Sclerotic cubital veins or multiple puncture marks in the cubital region with or without a history should materially assist in the diagnosis of malaria.

Treatment of malaria patients does not continue for a sufficiently long period of time.

Strict isolation and insistence on a complete cure of malaria patients in mental hospitals should be enforced. Breeding places for mosquitoes near such institutions, should not be permitted.

A cause and effect relationship between the increasing number of malaria sufferers who are drug addicts and the advent of malarial therapy of the syphilitic insane is strongly suggested. A thorough examination of the blood smear should be the rule for all donors.

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DISCUSSION

Dr. W. W. Shapiro, Chicago: We feel that the rising incidence in the combination of malaria and narcotic addiction constitutes a very definite public health menace and that this combination gives rise to a very morbid clinical condition. We wish to emphasize in our series that there is a definite lack of seasonal incidence. As a matter of fact, most of our patients acquired their malaria during the winter months.

With regard to the transmission of malaria, I wish to emphasize once again the very important point in connection with the latency of malarial infection. Reference was made in this paper to one patient, a young girl of eleven years of age, who, following some

trauma, was given a blood transfusion with her father as donor. Subsequent course of events showed that this youngster had developed a typical tertian malaria and further investigation brought out the fact that the father had developed malaria twenty-five years previously while in Asia Minor, and he thought he was entirely cured; during this time no symptoms of malarial infection had appeared.

I wish to emphasize several very important points which were brought up in this paper with particular reference to the recurrence of clinical malaria. First, the examination of the blood smear. Much was made of the fact that at times it is very difficult to recognize the malaria parasite, particularly when the examination is conducted by interns who have had no special training in this subject. Another point is that the malarial parasite frequently resembles artefacts on the blood slide and is very easily overlooked. Sometimes it is quite as difficult to find malaria parasites on a blood smear as is the tubercle bacillus and one should be very cautious in obscure fevers in making repeated examinations of the blood smears before any conclusion may be drawn as to whether malaria is or is not present. The second point that I wish to caution you about is the too frequent use of quinine in the treatment of obscure, somewhat continuous fevers. Although quinine has a relatively magic action on the fever of malaria, it sometimes works quite well in the nonspecific fevers and the clinician is only too apt to conclude that he has been dealing with a malarial patient when a satisfactory response is made to quinine therapy.

GAS GANGRENE TREATED WITH SULFANILAMIDE: REPORT OF THREE CASES

Harold R. Bohlman, Baltimore (*Journal A. M. A.*, July 24, 1937), used sulfanilamide in the treatment of three cases of gas gangrene. It appears to be a valuable adjunct in this respect and offers great promise with regard to saving of limb and life. Patient 1 had received 10,000 units of gas combined bacillus antitoxin. His temperature rose to 102 F. on the second day and fluctuated in an irregular manner. Because of great distention, extensive infection and the patient's toxicity, amputation seemed to offer little hope. His prognosis was very poor. Sulfanilamide therapy was instituted on the fifth day, 5 grains (0.3 Gm.) every six hours. This dose was continued for two days, followed by two tablets every six hours for five days and then one tablet every three hours for an additional two days. Eighteen hours after the first dose of sulfanilamide the patient's temperature was normal, he had no toxic symptoms and he appeared quite well. Patient 2 had a temperature on the third day of 100.4 F., with a pulse rate of 95; marked crepitation of gas could be felt about and above the wound, extending to the lateral side of the knee. The wound was discharging hemolyzed blood. Sulfanilamide therapy was started, five tablets every four hours. The patient received 25 grains (1.6 Gm.) the third day (the first day of this therapy), 75 grains (5 Gm.) the fourth day, 30 grains (2 Gm.) the fifth day and 45 grains (3 Gm.) the sixth day, after which it was discontinued. His temperature ranged from normal to 99 F. plus until the tenth day and thereafter was normal. All toxic symptoms disappeared on the second day of sulfanilamide therapy. Patient 3 was admitted to the Union Memorial Hospital in a severe state of shock. She had been injured in an elevator accident in a hotel. As soon as her condition warranted, she was taken to the operating room and a guillotine amputation of the right leg was done under cyclopropane anesthesia at the upper third of the thigh. Amputation was performed above the fracture area; the stump was closed in the usual manner with two cigaret drains. She was immediately given prophylactic doses of tetanus antitoxin and combined gas bacillus antitoxin. Her temperature on admission was 99.3, rose to 102.2 the second day, and was 103.3 the third day, with a pulse of 140 per minute. A culture of the wound revealed Bacillus welchii. The leukocyte count was 18,000. Hemoglobin was 70 per cent. Sulfanilamide was administered, four tablets of 5 grains (0.3 Gm.) each with 10 grains (0.65 Gm.) of sodium bicarbonate every four hours, totaling 60 grains (4 Gm.) the first day, 85 grains (5.5 Gm.) the second day, 65 grains (4.3) Gm.) the third day, 40 grains (2.6 Gm.) the fourth day, 60 grains (4 Gm.) the fifth day and 40 grains (2.6 Gm.) the sixth day, after which it was discontinued. Her temperature remained elevated until the seventh day, when it dropped to 98 and ranged to 99.5, being normal after the twenty-fifth day. Her pulse remained around 100 to the minute. X-ray examination of the stump on the second day revealed gas pockets. The urine on the second day showed albumin 2 plus, sugar 1 plus and numerous byaline casts, but thereafter was normal. Quantitative determination of sulfanilamide in the blood on the fourth day revealed 8.4 mg. per hundred cubic centimeters. As soon as gas bacilli were discovered in the discharge on the second day, the sutures in the stump were removed; there has been some necrosis and sloughing. The wound is at present granulating and the patient is progressing well toward complete recovery.

THE VISUAL RAVAGES OF TRACHOMA

While the ravages and destructive influence of trachoma are well known, it would be difficult to say offhand how great percentally is the visual damage from that disease and how much that damage can be remedied by treatment. Therefore Harry S. Gradle, Chicago, and Walter de Francois, Harrisburg, Ill. (*Journal A. M. A.*, July 24, 1937), made an analysis of the records of 2,713 consecutive cases of trachoma seen in the Southern Illinois Trachoma Clinics. The patients were divided into several classes according to visual acuity for specific reasons. 1. Vision better than 20/50: In the total number of 2,713 patients there were seventeen with unilateral anophthalmos from one cause or another. Of 5,409 eyes 2,889, or 53.5 per cent, had visual acuity of better than 20/50 and consequently are not considered in the article. 2. Vision between 20/50 and 20/200: Of the total number of 5,490 eyes 1,596, or 29.5 per cent, had visual acuity between 20/50 and 20/200. The reduction in vision was

due to trachoma in 653, or 40.9 per cent. Under treatment, 250, or 39.8 per cent, improved to vision of better than 20/50. 3. Vision less than 20/200: Of the total number of eyes 924, or 17 per cent, had vision of less than 20/200. The reduction in vision was due to trachoma in 566, or 61.1 per cent. Under treatment, 177, or 31.2 per cent, improveed to vision of better than 20/200. 4. Of the 2,713 patients 211, or 7.8 per cent, had suffered a reduction in vision in the better eyes as the result of trachoma to less than 20/200 (industrial blindness). Under treatment fifty-five, or 26.1 per cent, of that number improved to vision of better than 20/200. These figures are not universally applicable, for trachoma varies in severity in various localities according to the character of the population, degree of sanitation, climate, temperature, humidity and racial resistance. The patients in these clinics are Caucasians who have been more or less inbred for more than a century, who are mostly country dwellers, and whose ideas of sanitation are rudimentary.

THE SPECIFIC DYNAMIC ACTION OF BUTTER FAT, AND OF SUPERIMPOSED SUGAR

J. R. Murlin, A. C. Burton, and W. M. Barrows, Jr. (Jour. Nutr. 12:613, Dec. 10, 1936).

The specific dynamic action (S.D.A.—increase in heat production over post-absorptive basal heat production) of butterfat taken as heavy cream was studied in nine human subjects by means of a new respiration calorimeter, supplemented by the Tissot-Haldane method. The test meal contained 80 to 171 gms. fat.

The average S.D.A. expressed as percentage of the fat calories fed was 4.74. No relation was shown between S.D.A. and age of subjects, but there was a relation to tolerance for fat or capacity to digest and completely metabolize the fat.

Sugar taken several hours after the fat meal produced two types of dynamic response, (a) complete summation to the fat metabolism and (b) an increase greater than that due to the sugar alone. The difference was reckoned as fat metabolism. This extra heat may be due in part to oxidation of ketone bodies.

MEDICAL COMPENSATION FROM LIFE INSURANCE COMPANIES

At the medical section of the American Life convention recently held in Colorado Springs in June Dr. Cragin, in his opening address, gave the results of a questionnaire from 197 companies in regard to the amounts paid the medical profession in the year 1936. For medical fees, plus compensation, plus accident and health and leaving out state insurance, automobile liability, self-carriers, contract practice, a large portion of group and industrial payments; the figure reached the stupendous sum of $70,386,097.42.

From reliable sources an estimate can be made of well over $100,000,000 paid by all companies for medical services in the United States. It was estimated that about $800,000,000 was paid for medical services by individuals in this same year, and it is also interesting to note that $360,000,000 was paid for patent medicine.

GOUT: THE MODERN DISEASE

A. Cohen. (So. Med. & Surg. 98:637, Dec., 1936).

Recent studies of joint diseases suggest that gout is as prevalent today as it was a century ago, and that 90 per cent of the cases are unrecognized. It occurs at any age, but is most common in the third decade of life, particularly among sthenic, or strong, active persons.

Symptoms are malaise, irritability, and ravenous appetite for several weeks, followed by numbness in the muscles and a sensation of heat in the joints. An acute attack may be polyarticular, with severe pain in the joints, with redness and swelling. Appetite is poor, urine is concentrated and scanty, and blood uric acid is usually increased.

Treatment is by rest and a low-purin diet, with daily administration of colchicine. Foods permitted include milk, cream, butter, cheese, eggs, white bread, rice, macaroni, sago, tapioca, cabbage, caulifiower, lettuce, watercress, fruit, sugar, honey, jam, jelly, marmalade, potatoes. Foods forbidden are tea, coffee, alcohol, fish, fowl, meat, glandular organs, brown bread, peas, beans. Such a regimen is reported as successful in the treatment of 25 cases over periods ranging from a few months to a few years.

Society Proceedings

COOK COUNTY

CHICAGO MEDICAL SOCIETY

Regular meetings, Wednesday, October 13, 1937.

Program—"The Immunological Aspects of Syphilis," Illustrated with Lantern Slides. Charles C. Dennie, Kansas City, Mo.

Discussion—Francis E. Senear, Josiah J. Moore, James H. Mitchell.

PUBLIC LECTURE

Wednesday, October 27, 1937, "Modern Medical Charlatans," Dr. Morris Fishbein, Editor, Journal American Medical Association and Hygeia.

GREENE COUNTY

A Special Clinical Meeting of the Greene County Medical Society was held in the dining room of Hotel Lindsey at Carrollton, Friday, October 22, 1937.

Meeting was called to order at 7:30 P. M. by Vice-President, Dr. E. W. Thomas, regular order of business was dispensed with and Dr. T. B. Knox of Quincy was introduced. Dr. Knox is Councilor for the Sixth District. He gave us a brief talk in which he suggested a union of Jersey and Greene County Societies, also warned us of the various ways in which State Medicine is making a stealthy but sure advance.

By a unanimous vote of the Society the President was authorized to appoint a committee to confer with Jersey County relative to a union of the two organizations, said committee to report at December meeting in Roodhouse. Drs. Garrison and McLaren were appointed a committee.

Mr. F. A. Garner, Jr., of St. Louis representing Linde Air Products Company gave us a moving picture demonstration of various methods of administering oxygen which was both entertaining and instructive.

Dr. J. R. Compton of St. Louis was next introduced and gave us a brief but very practical paper on Oxygen Therapy.

Eleven members and five guests were present.

Wm. H. Garrison, Secretary.

Marriages

EMANUEL M. ARNOVITZ to Miss Margaret F. Beck, both of Granite City, Ill., August 11.

ANTHONY C. MARGLIANO, Joliet, Ill., to Miss Marcella Marguerite Coyne, in Chicago, July 15.

MARVIN F. WEISSMAN, Milford, Ill., to Miss Olive Maxwell of East Moline, recently.

Personals

Dr. Carolyn MacDonald addressed the Grundy County Federation of Women's Clubs at Coal City on October 12.

Dr. Margaret M. Kunde addressed the Woman's Club of Geneva on October 12.

Dr. Leon Unger and Marjorie Moore, Ph.D., discussed "Co-operative Studies on Hay Fever and Other Allergic Conditions," before the Chicago branch of the American Chemical Society, September 24.

Dr. H. E. Irish gave a paper on "Useful Drugs in Infancy," before the doctors of Coles-Cumberland, Clark and Douglas counties at Mattoon, October 7.

Dr. Robert S. Berghoff held a heart clinic for the doctors of Schuyler County at the Smith Memorial Hospital, Beardstown, October 6. A scientific program on Heart Disease was presented in the evening.

Dr. Paul H. Holinger gave a paper on "Foreign Bodies in the Air and Food Passages" and H. G. Poncher led a round table discussion on Pediatrics before the Knox County Medical Society, September 23, in Galesburg.

Dr. Noel Shaw presented a talk on "The Allergic Child," and E. L. Cornell spoke on "Management of Prolonged Labor," before the doctors of Lee-Whitside counties at Dixon, October 7.

Dr. M. H. Streicher, Chicago, addressed the Champaign County Medical Society, October 14, on "Diseases of the Rectum and Colon."

Dr. Robert S. Berghoff held a heart clinic for the Fulton County Medical Society at Canton, Illinois, October 20.

Dr. Philip Thorek gave a talk on "The Direct and Differential Diagnosis of Acute Gall Bladder Disease" before the DeWitt County Medical Society at Clinton, Illinois, October 20.

Drs. William C. Danforth and David S. Hillis presented a symposium on obstetrics before the LaSalle County Medical Society at Ottawa, October 21.

Drs. Clifford Grulee and Archibald Hoyne presented a program on pediatrics before the doctors of LaSalle County at Ottawa October 28, on "Infant Feeding" and "Diphtheria."

Drs. A. J. Kobak, Robert Black, Craig D. Rutler and W. B. Raycraft presented a symposium on obstetrics and pediatrics before the Morgan County Medical Society, October 28.

Dr. Samuel M. Feinberg gave a talk on "Allergy" before the Chicago Retail Druggists Association, October 19.

Dr. G. J. Rukstinat, Associate Professor of Pathology at Rush Medical College, addressed the McLean County Medical Society October 12 on the subject, "Causes of Death in Stillborn Infants."

Dr. Henry Eugene Irish addressed the Coles-Cumberland County Medical Society at Mattoon on October 7 on "Useful Drugs in Infancy."

Dr. Herman L. Kretschmer read a paper on the "Present Status of Trans-Urethral Prostatic Resection in the Treatment of Bladder Neck Obstruction" (by invitation) before the Kansas City Southwest Clinical Society, Kansas City, Mo., Wednesday morning, October 6. At noon on the same day at the Round Table Luncheon he gave a discussion on "Tumors of the Kidney." In the afternoon of the same day he talked on "Surgical Urology in Children" (by invitation).

October 18, Dr. John A. Wolfer addressed a group of student nurses at Lewis Institute on "Cancer" and Walter S. Priest spoke before a group of student nurses at University Clinics on "Heart Disease." These lectures are part of a series of lectures on Public Health and Social Problems conducted for student nurses in Chicago hospitals under the auspices of the Chicago Tuberculosis Institute.

Dr. Louis H. Block gave a series of three talks, September 23, 1937, at the Dixon State Hospi-

tal; one to the medical staff entitled "The status of the epidemic of bacillary dysentery in the Dixon State Hospital"; and another paper entitled: "Co-operation, a necessary requisite in the management of an epidemic of bacillary dysentery," to each of two groups comprising nurses, attendants and employees.

Meyer Solomon gave a talk on October 12 on the Psychology of Stuttering before a joint meeting of the American Speech Correction Association and the American Academy of Otolaryngology, in Chicago. He also recently spoke at Quincy, Ill., before the Mississippi Valley Medical Society in the morning, by radio in the afternoon, and before the All-Quincy Parent-Teachers Association in the evening, discussing emotional and personality disorders and marital discord and harmony.

On September 15, 1932, Dr. Gustavus M. Blech, of Chicago, was awarded the decoration of a knight-commander in the royal Order St. George. Although the next higher grade is that of Grand Officer, in a solemn conclave held May 15 last in Brussels, Belgium, Dr. Blech was voted the highest grade of Knight Grand Cross and was last week invested with the grand cordon and great star of that rank. It is learned, unofficially, that the only personage who was this year awarded this honor was the king of Italy. Dr. Blech has contributed many studies in the European literature dealing with medico-military problems which attracted favorable comment by foreign authorities.

Dr. Paul F. Kiouka, formerly at Arlington Heights, has been appointed city health director of Bloomington.

The Will-Grundy County Medical Society was addressed at Joliet, October 6, by Dr. George de Tarnowsky, Chicago, on gall-bladder disease.

Dr. Herbert N. Rafferty, Robinson, read a paper entitled "Success in Hernia Repair" before the Williamson County Medical Society at Marion, October 7.

The Chicago Council of Medical Women was addressed October 1 by Drs. Lucille H. Snow, Evanston, Ill., on "Cancer in Women" and Bertha Van Hoosen, "Maternal Mortality."

Dr. Joseph M. Keller, St. Louis, discussed "Disease of the Eye" before the Madison County Medical Society at its meeting in Alton, October 1.

Dr. Edward L. Jenkinson, among others, addressed the Chicago Roentgen Society, October 14, on "Cholecystography Before and After Medical Management."

At a meeting of the Chicago Pathological Society, October 11, the speakers included Drs. Arthur Weil and Erich Liebert, Chicago, and Gert Heilbrunn, Elgin on "The Histopathology of the Brain in Experimental Hyperinsulinism."

Dr. Frederick H. Falls, Chicago, among other speakers, discussed "Eclamptogenic Toxemia" before the Adams County Medical Society, October 11, in Quincy.

The Chicago Society of Allergy was addressed October 18 by Drs. Tell Nelson on "A Sheep Antibody to Pollen Which Blocks the Prausnitz-Kustner Reaction" and Paul Tachau, "Eczema and Similar Dermatoses in Infancy and Childhood."

At a meeting of the Kankakee County Medical Society in Kankakee, September 9, Dr. Clark W. Finnerud, Chicago, discussed "Diagnosis and Treatment of Common Skin Diseases."

Dr. Philip F. Schneider, Evanston, addressed the Bureau County Medical Society in Spring Valley, September 14, on "Progress in Obstetrics and Gynecology."

Dr. Rudolf Schindler, associate clinical professor of medicine, Division of Biological Sciences, University of Chicago, has been promoted to be associate professor of medicine, and Dr. Louis Bothman clinical professor of ophthalmology.

Drs. John T. Gernon, Chicago, and Paul H. Harmon, Springfield, addressed the Kankakee County Medical Society, Kankakee, October 14, on "Neurogenic Dysfunction of the Bladder" and "Poliomyelitis" respectively.

Dr. David A. Horner was chosen president-elect of the Chicago Gynecological Society at its recent annual meeting and Dr. George de Tarnowsky was installed as president. Dr. Edward D. Allen is secretary.

Dr. Charles F. McKhann, assistant professor of pediatrics and communicable diseases, Harvard University Medical School, Boston, addressed the Chicago Pediatric Society, October 19, among other speakers, on "Cross Infections in an Infant's and Children's Hospital."

At the annual joint meeting of the Institute of Medicine of Chicago and the Chicago Society of Internal Medicine, October 25, at the Palmer House, Sewall Wright, D.Sc., Ernest D. Burton

distinguished professor of zoology, University of Chicago, spoke on "The Hereditary Factor in Abnormal Development."

Dr. Dalton K. Rose, assistant professor of clinical genito-urinary surgery, Washington University School of Medicine, St. Louis, delivered the ninth annual William T. Belfield Lecture of the Chicago Urological Society, October 21, at the Palmer House, on "Neurologic Anatomy and Physiology of the Bladder and Its Clinical Application in Urology."

Dr. Frank J. Jirka, since 1933 health officer of Illinois, has resigned to reenter private practice in Chicago. Dr. Albert C. Baxter, assistant director of the department since Feb. 1, 1930, has been appointed acting director. Dr. Jirka's resignation was to be effective September 1, according to a recent announcement, but he continued in office during the outbreak of infantile paralysis. Dr. Baxter graduated from the University of Michigan Medical School, Ann Arbor, in 1907.

Dr. Paul H. Harmon addressed the Rock Island Medical Society on "Poliomyelitis" on October 12th, 1937.

He also addressed the Illinois State Nurses Conference, Springfield, Illinois, October 21, 1938 on the "Social Security Program for Crippled Children in the State of Illinois.

At a meeting of the Chicago Laryngological and Otological Society, October 4, the speakers included Drs. Archibald L. Hoyne on "Use of P.-Aminophenylsulfanilamide in the Treatment of Scarlet Fever Carriers"; John A. Bigler, Highland Park, Ill., "Blood Cell Response to Sulfanilamide Therapy," and George S. Livingston, "Sulfanilamide Therapy in Otolaryngology."

Dr. Joseph J. Eller, New York, addressed the Peoria City Medical Society, October 16, on "The Latest Methods of Treatment of Skin Conditions." At a meeting of the society, October 5, Dr. Laurence H. Mayers, assistant professor of medicine, Northwestern University Medical School, Chicago, discussed "Treatment of Arthritis."

News Notes

State and Kane county officials and medical leaders yesterday extolled the memory of Dr. Henry J. Gahagan, noted psychiatrist, at the dedication of a new $128,000 building at the Elgin State hospital. The building, where new mental treatments will be advanced, was formally named the Gahagan building.

Among the speakers were Mrs. Blanche Fritz, assistant director of the state department of public welfare; Dr. Francis Gerty, superintendent of the Cook County Psychopathic hospital; Judges Olney C. Allen and Harry C. Daniels, and Dr. Charles F. Read, head of the Elgin hospital.

The lauded Dr. Gahagan as a leader in his profession, and as a humanitarian. Dr. Gahagan was killed in an auto accident last November. As superintendent of the state hospital years ago, he developed many improvements in the treatment of mental cases that are now in universal use.

—During the past year the College of Medicine of the University of Illinois has received, by gift, two notable additions to its Medical Library.

A valuable collection of some 1500 selected books, also numerous separates and reports in the field of dermatology, was presented by Dr. William Allen Pusey. This collection has now been placed in the Medical Library and is available for the use of students and physicians.

The other gift came from Dr. Arthur E. Hertzler of Halstead, Kansas. This collection consists of about 7000 volumes and 8000 separates, largely in the field of surgery and surgical pathology. The books have been received at the College of Medicine and plans are now being made to arrange them in a way that will best serve students and the medical profession.

—The Physicians' Association of the Illinois Department of Public Welfare held its second annual meeting in the rooms of the Kankakee Medical Society, Kankakee, October 22, under the presidency of Dr. George A. Wiltrakis, Elgin. Speakers included Drs. Shirley W. Lane, Kankakee, on "Medical Economics in Relation to State Service"; Louis Belinson, Lincoln, "Progressive Muscular Dystrophy," and G. Heilbrunn, Elgin, "Insulin Shock Therapy in Dementia Praecox."

—The speakers at the banquet session of the symposium on occupational diseases of Northwestern University Medical School, September 28, were Mr. B. C. Heacock, president, Caterpillar Tractor Company, Peoria, and of the Illi-

nois Manufacturers Association, on "The Prevention of Occupational Disease," and Dr. Morris Fishbein, Editor, J. A. M. A., "The Future of Industrial Medicine." Dr. Irving S. Cutter, dean of the medical school, was toastmaster.

—The Chicago Woman's Club, through its cancer research committee, began a series of public lectures on cancer, October 21, with a talk by Dr. William A. O'brien, associate professor of pathology and preventive medicine and public health, University of Minnesota Medical School, Minneapolis. His subject was "General Aspects of Cancer." Other lecturers in the series are:

Dr. Clark W. Finnerud, assistant clinical professor of dermatology, Rush Medical College, Univedsity of Chicago, October 28, Skin Cancer.

Dr. Gatewood, clinical professor of surgery, Rush Medical College, November 4, Cancer of the Digestive Tract with Special Reference to the Stomach and Rectum.

Dr. Frank L. Rector, Evanston, Ill., field representative, American Society for the Control of Cancer, What Comprises Adequate facilities for the Care of Cancer Patients.

—Dr. Franz G. Alexander, director, Institute for Psychoanalysis, will conduct an introductory course of lectures on psychoanalysis during the first and second quarters of the institute, beginning October 27. The course will include the following subjects:

Historical Development of the Main Concepts of Psychoanalysis.

Concept of the Unconscious.

The fundamentals of Psychic Dynamics.

Theory of Instincts.

Theory of Dreams.

Development of the Personality.

General Concepts of the Structure of Neuroses and Psychoses.

Principles of the Psychoanalytic Technic.

Application of Psychoanalysis to Other Sciences.

Beginning October 23, Dr. Leon J. Saul will present a review of psychoanalytic writings on sociological subjects. Conferences and seminars will make up the regular program for members of the Chicago Psychoanalytic Society and candidates of the institute only, with Drs. Alexander, Thomas M. French and Therese Benedek as the lecturers.

—A program with motion pictures on the use of insulin and metrazol in the treatment of dementia praecox and other psychoses has been prepared by the medical staff of the Michell Sanatorium at Peoria and listed with the Educational Committee for use before County Societies.

Deaths

Otto W. Henssler, Chicago; College of Physicians and Surgeons of Chicago, 1893; aged 68; died, July 26, in the American Hospital, of carcinoma of the stomach.

David Alexander Hilliard, Geff, Ill.; Marion-Sims-Beaumont Medical College, St. Louis, 1902; member of the Illinois State Medical Society; aged 64; died, July 11, of infection of the gallbladder.

Emerit E. Jouett, Carrollton, Ill.; Marion-Sims College of Medicine, St. Louis, 1891; member of the Illinois State Medical Society; formerly member of the city council; aged 71; died, July 29, of carcinoma of the maxilla with metastases.

Harold Richard Keegan, Chicago; St. Louis University School of Medicine, 1925; member of the Illinois State Medical Society; aged 41; was killed, July 28, when he fell from a ladder at the Wilgus Sanitarium, Rockford, where he was a patient.

Fred Joseph Kraus, Chicago; Rush Medical College, Chicago, 1929; member of the Illinois State Medical Society; president of the staff of the Woodlawn Hospital; aged 37; died suddenly, July 11, of coronary thrombosis.

Bernard Joseph Lachner, Rock Island, Ill.; Jefferson Medical College of Philadelphia, 1906; a Fellow, A. M. A.; fellow of the American College of Surgeons; served during the World War; on the staff of St. Anthony's Hospital; aged 59; died, July 1, of cerebral hemorrhage.

Woodman Robert Marriett, Capron, Ill.; Rush Medical College, Chicago, 1886; aged 79; died, July 18, in the Municipal Hospital, Beloit, Wis., of prostatic hypertrophy.

William L. Murphy, Aurora, Ill.; Northwestern University Medical School, Chicago, 1903; a Fellow, A. M. A.; on the staffs of St. Joseph Mercy Hospital and St. Charles Hospital; aged 58; died, July 25, of angina pectoris.

Milo H. Trovillion, Metropolis, Ill.; St. Louis College of Physicians and Surgeons, 1892; member of the Illinois State Medical Society; secretary of the Massac County Medical Society; aged 70; died, July 15

George Heywood Vernon, Beardstown, Ill.; Hospital College of Medicine, Louisville, Ky., 1898; member of the Illinois State Medical Society; aged 62; died, July 6, of heart disease.

William J. Whitaker, Dongola, Ill.; Barnes Medical College, St. Louis, 1900; member of the Illinois State Medical Society; aged 65; died, July 17.

Stanley F. Wietrzynski, Chicago; Chicago College of Medicine and Surgery, 1914; served with the Polish Army during the world War; aged 46; was found dead, July 12.

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